5

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Contractors: Gaskill Construction Company and Union Paving Company.

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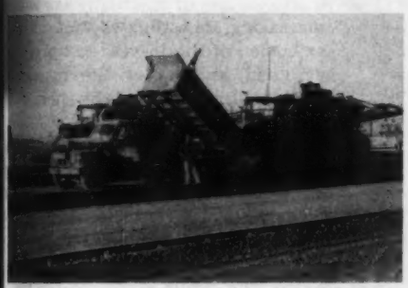

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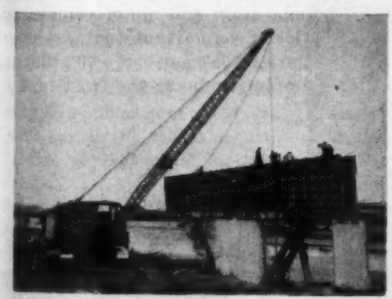

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Editorial

Where will the road money come from?

May is a busy month for contractors and engineers in the highway field. Engineers are staking out line and grade for the construction of roads and bridges. Contractors have brought their equipment to the job and are already moving earth and laying pavement. The scene is satisfying. New stretches of needed highway—a national asset—are being added to the economic worth of the country. But back in Washington and in the state capitals, highway officials are worried. No question of technical accomplishments is involved. The problem is money, and its relationship with taxes, the road user, and with the federal and state governments.

A crisis is in the making in the construction of the 41,000-mile Interstate System. This system is being financed under the Highway Revenue Act of 1956 on a pay-as-you-go basis, through a Highway Trust Fund based on revenue from federal motor-fuel and other taxes. With the peak of the highway construction program now approaching, expenditures are soon expected to exceed revenues. Unless new revenue is provided, no funds can be apportioned to the Interstate System during 1959 for the fiscal year of 1961, and such a freeze could continue for still another year or two. This cutback would seriously affect the entire Road Program, which is why the President in his 1960 budget message recommended an increase in motor-fuel taxes of 1½ cents a gallon starting July 1, 1959.

Here is an area where federal taxation impinges on state taxation. Gasoline taxes are the chief source of revenue for the road-building programs of the various states, and if the federal government increases its take in this field from 3 to 4½ cents per gallon, many states cannot, in fairness to the motorist, increase his tax burden still further.

Several states, too, are finding it difficult to meet their share of this federal-state, jointly financed Road Program. Financing the program by long-term loans has been rejected by Congress since the interest charges would be prohibitively high.

An alternate suggestion to get past this critical period in financing has been advanced by Charles M. Noble, consulting engineer of Princeton, N. J. Noble is one of the top highway experts in the country outside of government, having recently served as director of highways in Ohio, and before that as chief engineer of the New Jersey Turnpike Authority and the New Jersey State Highway Department. He advocates the use of U. S. short-term Treasury notes to bridge the gap now coming up. The notes would be quickly repaid from the Highway Trust Fund as soon as federal receipts exceed the programmed apportionments. Noble feels that in the latter years of the 13-year interstate program, construction costs will be lessening, while revenue from the increased use of the highways will be increasing. He estimates that a 3-year extension of the 16-year tax program, designed to pay for the interstate, would more than cover the short-term notes.

This suggestion may be about as painless a plan as is possible. The states would have the future gas tax field to themselves. The federal government would immediately get the cash to keep the Road Program rolling along. The public would get the highways it needs in the shortest time possible. The foreseeable increases in population and motor vehicles would yield revenue from highway users in the late '60's and early '70's that would amply reimburse the trust fund.

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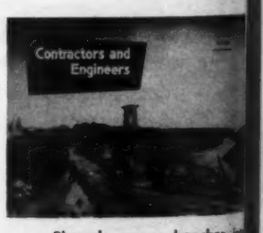

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Niagara Power Project —a dream come true

The $720 million Niagara Power Project, being built by the Power Authority of the State of New York, is a dream come true to many engineers who have watched most of the 200,000 cfs flowing down the Niagara River being wasted. The project will soon harness the maximum head available—about 300 feet—almost twice the drop of the famous falls.

The river water will be diverted at a point about three miles above the falls. Here, the water level is plus 563 feet. Diversion is being accomplished by an intake structure (see page 6) which feeds two 46-foot-wide, 66-foot-high, and 4-mile-long underground conduits.

At the end of the conduits, near the Tuscarora pump-generating plant, the water will enter an open man-made canal and will have an elevation of about plus 550 feet. This canal, about 3,000 feet long, will connect the Tuscarora plant with the intake of the main generating unit, the Niagara generating plant at Lewiston, N. Y. (see page 16).

Generating plant

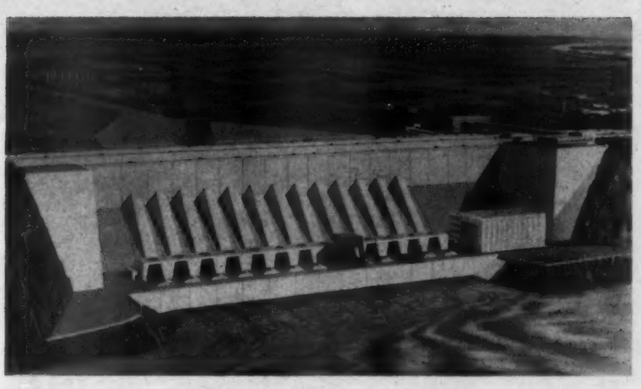
From the forebay pool, the canal water will enter thirteen 28-foot-diameter penstocks and fall over 300 feet to 13 turbine generators generating a total of 1,950,000 kw. The plant, 1,840 feet long and recessed into the side of the gorge, requires the removal of 9,750,000 cubic yards of rock.

According to the International Treaty of 1950 between the United States and Canada, at least 100,000 cfs of water must flow over the falls during the daytime in the April-October tourist season. The treaty also provides for a minimum of 50,000 cfs at night during the tourist season and during daylight hours for the rest of the year.

During the night and weekends, when power demand is normally low, water will be stored in a 45,000-acre-foot reservoir. This will be used during the daytime, when demand is high and the supply of river water is low. At night, water will be pumped by the Tuscarora plant from the open canal into the reservoir. Some of the power from the Niagara generating plant will be used to drive electric motors connected to pumps in the Tuscarora plant so that part of the canal water can be lifted to the reservoir.

During the daytime, when the power demand is high, the reservoir water will be allowed to flow back down through the Tuscarora plant. This flow will rotate the pumps, which will act as turbines, turning the motors. The motors, now acting as generators, will turn in the opposite direction, producing electric power. There will be 12 pump-turbine and motor-generating units to produce a total of 240,000 kw.

After passing through the Tuscarora pump-generating plant, the water will continue down the canal into the forebay, and through the Niagara generating plant for the production of an additional 1,950,000 kw, giving the entire Niagara Power Project a total rated capacity of 2,190,000 kw. THE END



This drawing shows the completed $99 million generating plant, the main facility of the Niagara Power Project. Located about 3 miles downstream from the falls, the plant will have a 1,950,000-kilowatt capacity when completed in 1962.

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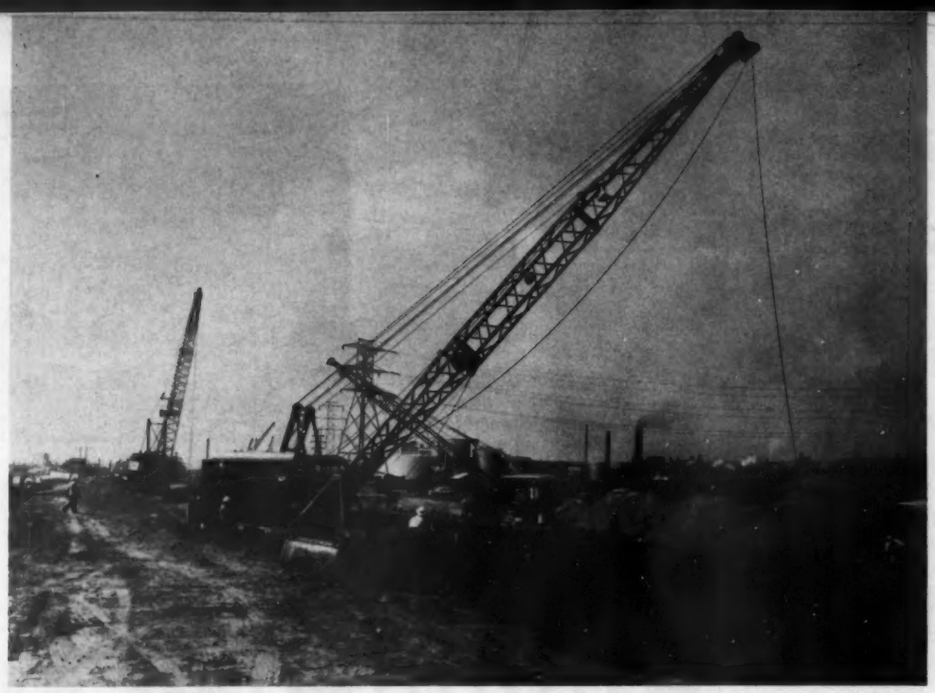

Before starting on the river intake for the Niagara Power Project, M-C&S is working on industrial water intakes and conduit for plants along the Niagara River. Existing lines will be blocked by the cofferdam in the river intake area, some 1,000 feet downstream. A Manitowoc and two Lorains are backfilling the trench.

Seven conduits that will run 3,400 feet to tie into existing industrial conduits are being located in the 45-foot-wide and 26-foot-deep trench. A barge-mounted crane in the river drives sheeting for cofferdam that will enclose the river intake area.

Work on industrial water conduit clears way for constructing Niagara intakes, waterways

Second-largest contract for Niagara Power Project also covers relocation of utilities, rail lines, roads

Before work could begin on the Niagara Power Project's $65,962,000 river intake which includes a 6,600-foot section of conduit waterways, Merritt-Chapman & Scott Corp., New York, N. Y., had the massive task of building industrial water intakes for existing plants along the Niagara River. At the same time, M-C&S had to relocate a maze of utilities that ran above and under the ground, three railroads, and five major thoroughfares through the town of Niagara Falls, N. Y.

M-C&S started work on this contract—the second largest awarded for

Soldier beams driven on 5-foot centers and lagged with 3-inch timbers line the wall of the trench. Top and bottom wales along both walls are braced by transverse struts on 15-foot centers. Cranes in background backfill the 24 to 84-inch diameter industrial intake lines.

While crews work on the industrial intake and conduit upstream, other crews get a start on the conduit excavation for the power project waterway. This Marion backhoe works close to four Gardner-Denver Air Tracs line-drilling the edge of the trenches.

A Marion 111-M with 80-foot boom and Esco 4-yard dragline bucket starts excavating for one of the two 22,00-foot-long conduit waterways that will bring water to the power generating plants to be built near Lewiston, N. Y. Here a Euclid rear-dump is being loaded.

The extremely high clay content in the material excavated from the waterway areas is apparent at the spoil area north of the project, where a Euclid is end-dumping. The material will be used to backfill the horseshoe-shaped conduits and shape the grade for the proposed Niagara Parkway.

In the area where Buffalo Avenue will be relocated, a Lima 2400 with 6-yard dragline bucket excavates for an enclosed conduit waterway. The two Marlow pumps are draining water from a low point in the excavation.

the $720 million Niagara Power Project—during May, 1958, by building a trench for the industrial intake conduits. This had to be completed before work on the river intake could start because the source of water had to be maintained for plants supplied by individual conduits along the area of the proposed river intake structures. A cofferdam enclosing this area, to permit construction of the intake structures in the dry, completely blocks the existing industrial intakes.

A trench 45 feet wide, 26 feet deep, and 3,400 feet long was formed for the seven conduits that will tie into the existing industrial conduits. The new conduits, ranging from 24 to 84 inches in diameter, will connect the industrial intake structures, located upstream from the main waterway river intakes, with the existing conduits.

One 24-inch-diameter line will supply the Oldbury Chemical plant; two 36-inch lines will furnish water to the Union Carbide and Niagara Alkali plants; one 48-inch line will serve the Kimberly-Clark site; two 60-inch lines are needed for Hooker Chemical; an 84-inch conduit is required for the Electro-Metal plant.

Merritt-Chapman drove 30-foot-long 14BP73 soldier beams on 5-foot centers to form the wall for the conduit trench. The soldier beams, driven to rock by a McKiernan-Terry 9-B-3 hammer mounted on a Manitowoc 3000B crane, had 3-inch-thick timber lagging installed as the trench excavation progressed. A 10BP42 wale, running the entire length of the trench, was connected near the tops of the soldier beams. A second wale, located about ten feet below the first, was connected to the soldier beams of each wall and was made up of 14BP89 sections. The top wale was transversely braced by a 10BP42 steel strut on 15-foot centers along the trench. The lower, mid-depth wales were later braced with 12BP53 struts, also on 15-foot centers.

M-C&S handled the trench excavation at the start with a Cat D8 tractor-dozer, which broke up the hardpan and pushed the material to the clamshells of the cranes. As the excavation got deeper, a Cat D6 with a ripper attachment broke up the hardpan along the eastern end of the trench. Some rock drilling and blasting work was required at the western end.

After the trench was excavated and leveled, a crushed-stone base was placed to support the 8-foot-long

(*Continued on next page*)

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Joints of the concrete conduit sections are sealed by a Gunite grouting machine powered by a Gardner-Denver 900-cfm compressor. In the background, a truck delivers backfill, and a Michigan front-end loader is pushing the material into the trench.

tied back to the shore line with two 600-foot legs, consists of walls made up of single interlocking sheet piles driven to rock. Backfill will be placed on both sides of the cofferdam sheeting to minimize leakage and strengthen the walls. Cells have been driven and backfilled at each of the corners to prevent erosion of the cofferdam by the fast-flowing river. Three barge-mounted rigs handled the driving of the sheet piles—a Koehring crane and two steam-operated derricks.

The shore line adjacent to each leg of the cofferdam was treated with grout to reduce the amount of seepage at these points. Gardner-Denver grouting pumps, powered by an Ingersoll-Rand air compressor, forced the mix of Lehigh portland cement and water through 2-inch-diameter pipe sections and into the ground.

Intake structures

The two 700-foot-long intakes will be built along the shore line, immediately adjacent to each other, and will have upstream and downstream river walls to support backfill for the proposed Niagara Parkway. The west river wall, about 1,000 feet long, will extend downstream from Intake No. 2; while the east wall will extend 500 feet upstream from Intake No. 1.

Each intake will feed river water into one of the two 22,000-foot-long conduit waterways that will furnish water for the power generating plant being built at Lewiston, N. Y. The invert elevation at the upstream end

(Continued from preceding page)

concrete pipe sections making up the conduits. Pipe sections were connected and sealed with pressure grout produced by a Gunite machine powered by a Gardner-Denver 900-cfm air compressor. After sealing the joints, the contractor backfilled the trench with select sand to form a protective 1-foot cover over the conduits. The remaining height of the trench was backfilled with excavation obtained on the job.

Cofferdams built

The new industrial intake structures, which divert the river water into the conduits, were built along the shore line within a cellular cofferdam. This 25-cell cofferdam was located about 800 to 1,000 feet upstream from the main cofferdam enclosing the waterway intakes. The three industrial water-intake structures will be permanent installations; the existing industrial intakes will be removed by the construction of the two waterway intakes.

In preparing for the construction of the river intake structure, which consists of two reinforced-concrete wide-mouth harmonica-type intakes, each 840 feet long, the contractor had to build a second cofferdam downstream from the industrial intakes. This 3-sided cofferdam, 4,700 feet long and

Roster at intake project

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of Intake No. 1 is plus 518 feet. From this point to the extreme downstream end of Intake No. 2, the invert elevation decreases on a straight, gentle slope to elevation plus 488 feet.

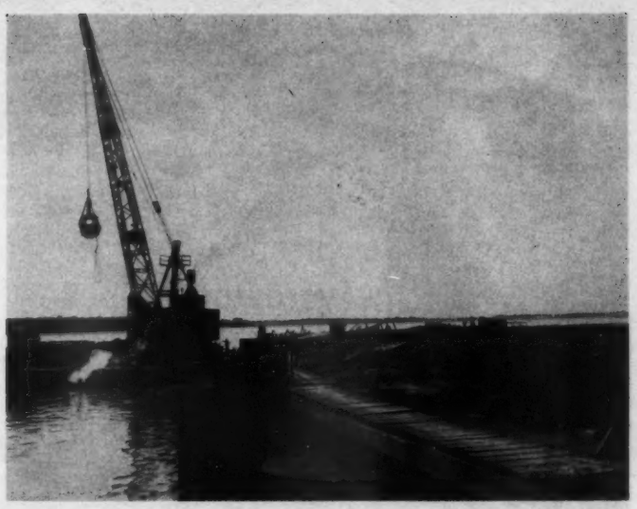
The mean water level of the river is at about elevation plus 563 feet, while the rock along the intake structures is at about plus 518 feet. To construct the sloping invert of the intake structures, the contractor will have to drill and blast the river bottom. The blasting will also be used to shape a 500-foot-wide channel along the river side of the intakes. M-C&S plans to use a drill barge and a 10-cubic-yard dipper dredge to handle the 2,500,000 cubic yards of river excavation—half of which is rock. Most of this material will be used to build up the grade for the Niagara Parkway which will skirt the river at the intake location.

Each intake will have 48 vertical openings, formed by concrete vanes, which will vary in height from 26.5 feet at the upstream ends of the intakes to about 13 feet at the downstream ends. These openings will be spaced on 11-foot 8-inch centers for each intake. For Intake No. 1 and No. 2, the 47 concrete vanes will be formed at 35 degrees with the downstream flow of the river.

The vanes and the shaped river bottom will permit the water to enter the intake structures and, in turn, the two enclosed waterway conduits.

Conduit excavation

While work progressed along the shore line, M-C&S started a huge fleet of excavation equipment working on the 6,600-foot waterway section of the contract. This calls for the construction of two reinforced-concrete horseshoe-shaped conduits by the cut-and-cover method.



While crews are laying the conduit for the water lines, a barge-mounted Wiley steam derrick uses a clamshell to fill in the sheeting cells making up the cofferdam for the industrial intake structures. This cofferdam is upstream from the main cofferdam for the waterway intake and power project.

The inside dimension, measured between the vertical side walls of each conduit, is 46 feet. The over-all height, between the bottom slab of the conduit and the crown of the 3-hinged arch of the roof, is 66 feet. M-C&S is excavating trenches north of the intake structures for each of the parallel conduits, which are about 200 feet on centers. The side walls and bottom slab of each conduit will have a minimum thickness of 2½ feet and will be formed against the exposed rock of the trenches.

The trench at the top of each conduit wall is being notched 7 feet, widening it so that a reinforced-concrete haunch can be poured to support the arched-roof sections. Two semi-arches will form the conduit roof and will permit the construction of expansion keys at each shoulder and the crown.

Each 43-foot-high conduit wall, measured above the botom slab, will be tied to the rock trench wall by seven inclined No. 11 reinforcing bars doweled 7 feet 6 inches into the rock. Eight vertical dowels will anchor the conduit slab. These lines of dowels will be installed on 8-foot centers along the entire length of the conduits to help overcome any uplift caused by hydrostatic pressure. This precaution has been necessary because most of the conduit length is below the ground water table, and this could cause damaging uplift pressures whenever any of the conduits are drained.

M-C&S is using Gardner-Denver Air Tracs, powered by Gardner-Denver air compressors, to handle all the rock excavation on the project. The contractor is shaping the conduit trenches by line-drilling the outer limits with 3½-inch-diameter holes on 9-inch centers and sinking 3½-

(Continued on page 11)

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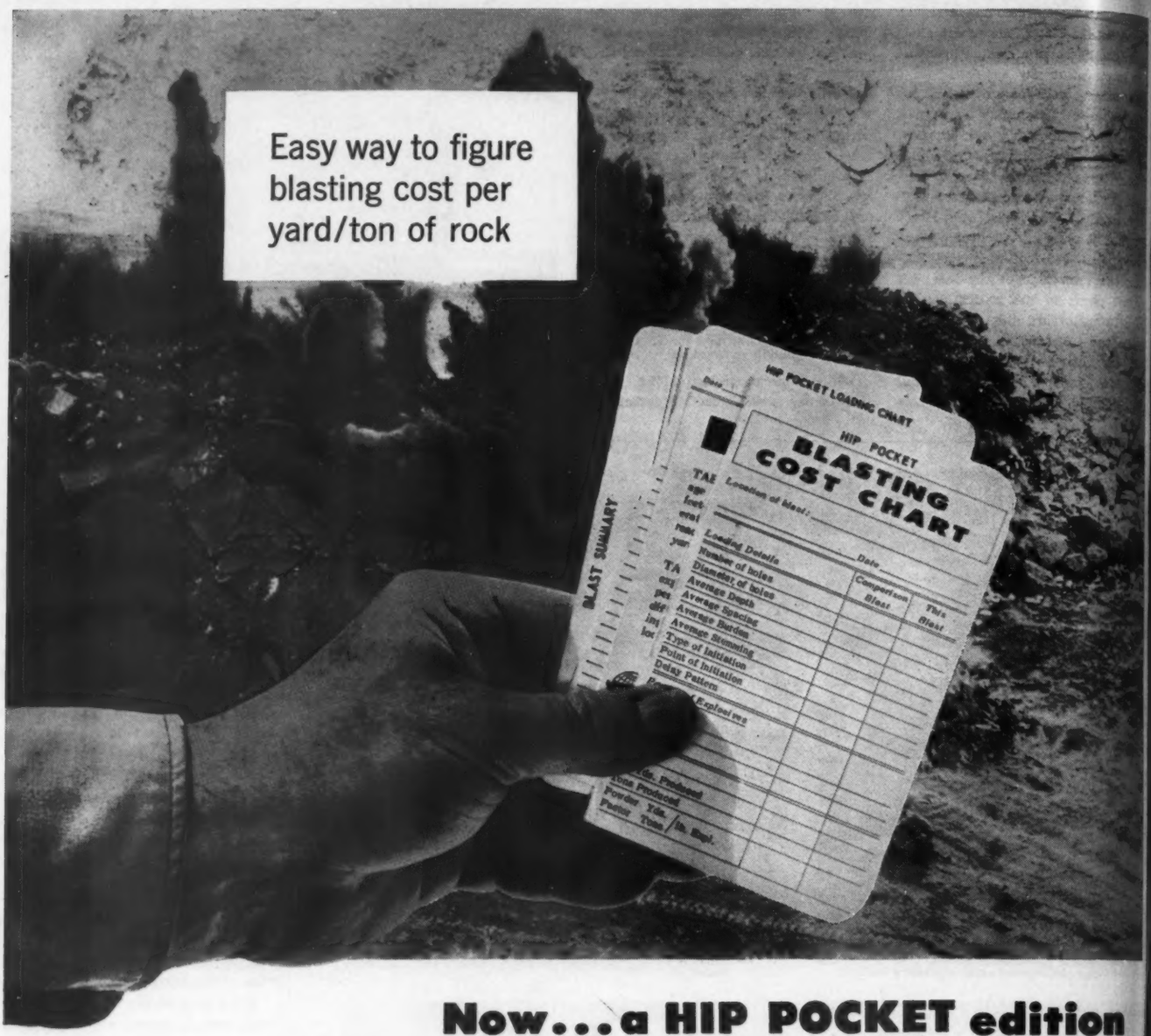

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Here's a new 1959 Atlas Blasting Cost Chart that goes right out on the job with you—helps you record the cost data you need to protect your profits.

The original Blasting Cost Chart, with instruction book and Slide Rule, is being used successfully by hundreds of operators. Now, to make it more convenient, Atlas has added this "hip-pocket" edition. With it you can compare results from blast to blast to determine methods that pay off best. It helps you assemble quick cost facts on drilling, secondary breakage, digging, hauling, and crushing.

Your Atlas representative will be glad to show you how to use the new "hip-pocket" Cost Chart. He has a kit full of information that may help reduce your costs and protect your profits. Ask him for details, or write us direct.

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For more facts, use Request Card at page 18 and circle No. 205

(Continued from page 9)

inch-diameter blast holes in a 7×8-foot pattern within the line drilling. The line drilling forms the desired vertical trench walls and controls the blasting.

The entire project requires over 7,400,000 cubic yards of earth and rock to be excavated. This material is being handled by a huge assortment of shovels, draglines, backhoes, and clamshells. Over 60 Euclid TD-65 rear-dumps in the 27-ton class and 7 Mack 10-wheel dump trucks are hauling this excavation to a spoil area, which will eventually supply the backfill necessary to cover the conduits and shape the grade for the parkway.

Where the conduit excavation crosses a vehicular thoroughfare, the contractor has built 3-span 400-foot-long steel bridges to carry the traffic over both conduit trenches. This area between the conduit trenches will be used as a haul road, for concrete and excavation, by rigs working in both the intake and the conduit areas.

The batching setup has been located at the northern end of the conduits, the farthest point from the intake structures, because of a lack of available land throughout the project. This, plus the congestion just north of the intake structures, made it necessary to eliminate any bottlenecks along the haul route. By bridging the vehicular traffic over this haul road, M-C&S has prevented any intermingling of the local traffic and its equipment.

Personnel

Merritt-Chapman & Scott's intake project is under the supervision of Myles C. McGough, vice president. E. A. Pasha, project manager, heads the field staff, which includes T. J. Slattery, assistant to the project manager; John L. Dugan, general superintendent; and Duke Grkovic, project engineeer. William Denny, executive vice president in charge of the firm's Construction Department, is in over-all charge of construction operations on the two massive M-C&S contracts at the Niagara Power Project.

Fred McKune is the resident engineer on the intake project for Uhl, Hall & Rich, Boston, Mass., the consulting engineering firm in charge of design and construction supervision for the Power Authority of the State of New York. THE END

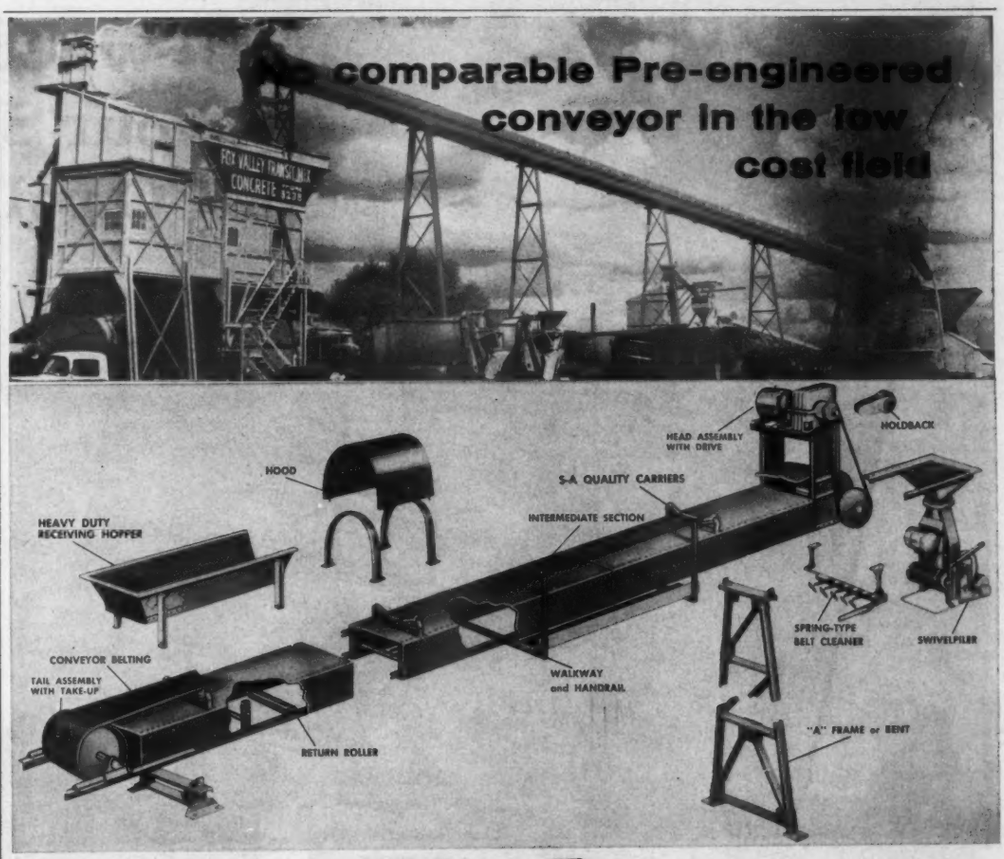
Hale Fire Pump elects chairman of the board

E. J. Wendell and J. S. Bennett have been elected chairman of the board and president, respectively, of the Hale Fire Pump Co., manufacturers of fire pumps and centrifugal pumps, in Conshohocken, Pa.

Wendell is former president and one of the founders of the firm.

Bennett joined the organization two years ago as assistant to the president. He was formerly vice president of the American Engineering Co. and was one of the founders and chairman of the Fluid Power Division of ASME.

Two Michigan 175 front-end loaders are used to charge a dump truck with stockpiled backfill material for the industrial intake conduits.



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Here's a "do it yourself" conveyor that not only provides for fast, simple on-the-job erection but combines quality conveyor components and features provided in no other pre-engineered conveyor. Exclusive Bent Plate Decking assures easy erection or alteration and provides protection for return run of belt. Four high-strength bolts fasten head assembly . . . eight bolts join intermediate sections . . . and six bolts connect tail assembly — for simplest installation ever. Check features at right.

- S-A CURVE CROWN® Pulleys — Revolutionary new crown provides greater belt training effect while minimizing belt stretch and wear. New SQUEEZELOCK® Hub provides full gripping power — eliminates keyways.
- S-A Quality Carriers — Precision ball bearing carrier rollers (4" or 5") assure smooth, trouble-free performance. Roller bearing carriers optional.
- SEALMASTER® Self-Aligning Ball Bearing Units — Performance proven in countless conveyor installations.
- S-A SACO® Speed Reducer — Rugged, compact, quiet unit . . . famous for dependability. Shaft mounted reducers optional.
- S-A Spring-Type Belt Cleaner — Wipes belt clean of wet or dry materials. Simple to install, adjustable, saves belt, eliminates clean-up maintenance.
- S-A Holdback — Easily mounted on headshaft to prevent belt reversal Protects equipment and personnel.
- S-A SWIVELPILER® — Extend reach of conveyors tenfold with powerful centrifugal thrower unit.

AVAILABLE IN 18", 20", 24", 30" and 36" WIDTH CONVEYORS—DELIVERED FROM STOCK.

WRITE FOR BULLETIN 458

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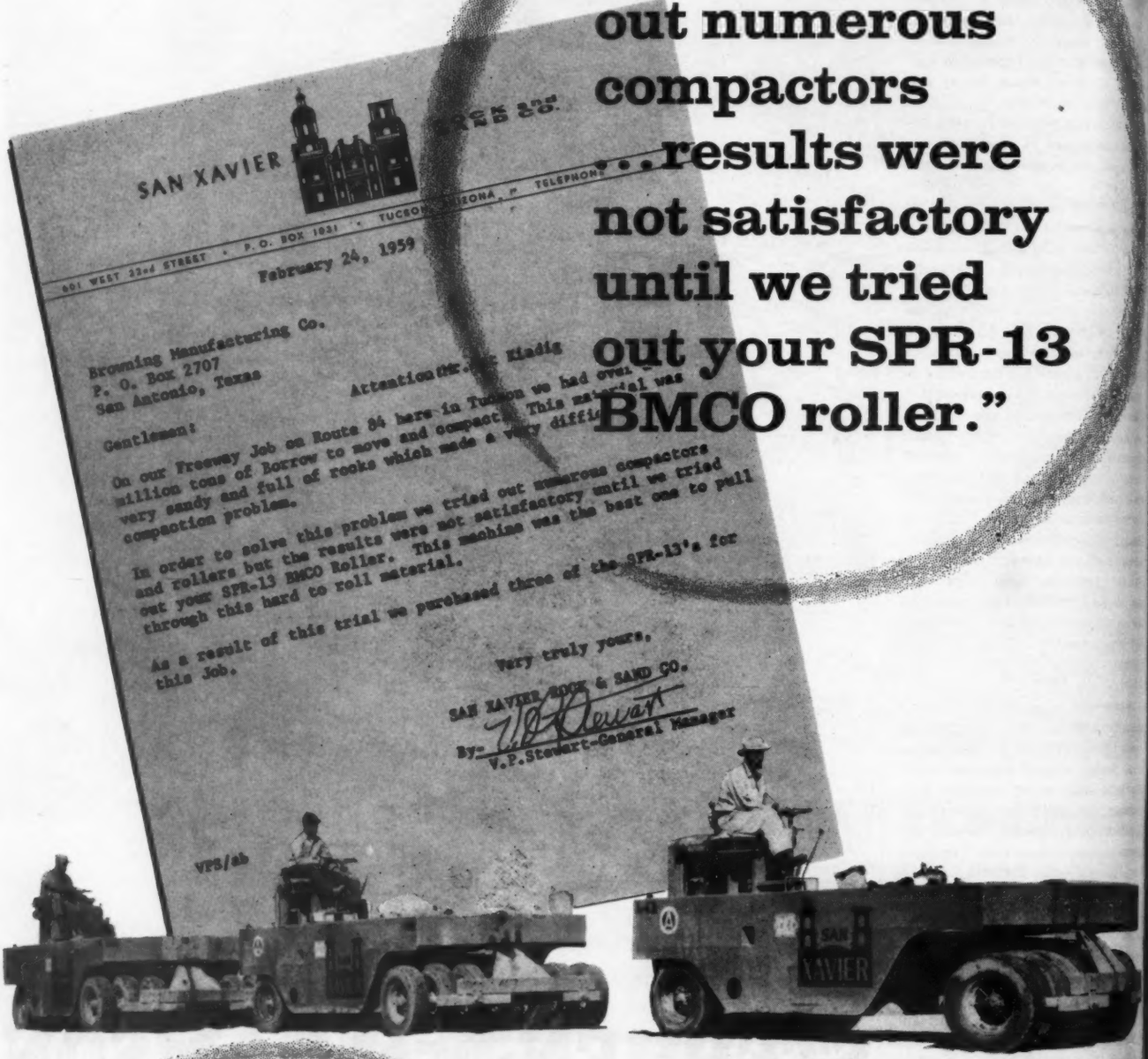
"...we tried out numerous compactors ...results were not satisfactory until we tried out your SPR-13 BMCO roller."


SAN XAVIER
601 WEST 33rd STREET • P. O. BOX 1031 • TUCSON, ARIZONA • TELEPHONE
February 24, 1959
Browning Manufacturing Co.
P. O. Box 2707
San Antonio, Texas
Attention Mr. Kladig
Gentlemen:
On our Freeway Job on Route 84 here in Tucson we had over
million tons of Borrow to move and compact. This material was
very sandy and full of rocks which made a very difficult
compaction problem.
In order to solve this problem we tried out numerous compactors
and rollers but the results were not satisfactory until we tried
out your SPR-13 BMCO Roller. This machine was the best one to pull
through this hard to roll material.
As a result of this trial we purchased three of the SPR-13's for
this Job.
Very truly yours,
SAN XAVIER ROCK & SAND CO.
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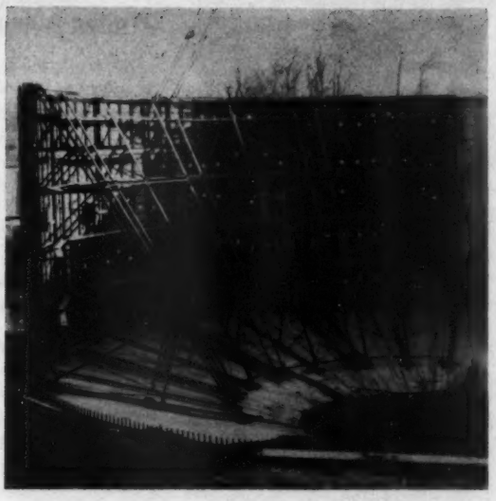
On a Mansfield, Ohio, sewage-treatment tank, the contractor used Symons steel-ply prefab forms ganged and braced with steel trusses on the inside of the tanks. Outside forms were erected as concrete placement was carried up. Four ganged sections were used to complete a third of the tank at one time.



Ganged forms used on sewage-treatment tanks

Freibel & Hartman, Shelby, Ohio, contractor, has found a new use for prefabs in ganged forming on a $4 million sewage-treatment plant in Mansfield, Ohio. The project involved using steel-ply forms ganged and braced with steel trusses on the inside of the tanks, and forms erected for the outside of the walls.

Erection pattern

One tier of 6-foot forms was erected on the outside, and every other form in the second tier was put in place. If time permitted, every other vertical row of forms was erected to the top of the wall. Ties were placed in the ganged form from permanent scaffolds. In order to overcome concrete-placement and vibrating problems, crews erected the rest of the forms as concrete was placed. On the first horizontal row there were Symons 6-foot forms and 4-foot flexible fillers, which were lapped all the way to the top to speed up erection. The 2,400 square feet of forming required on the outside of the tank was erected as concrete was placed by a laydown bucket at the rate of about 4 feet per hour.

To be able to remove the tie ends before crews stripped the forms, the contractor used 1½-inch flexible fillers between forms in the inside gangs, and some 2-inch flexible fillers on the outside wall. These were punched for Williams Little Giant ties and Williams duo-tie ends.

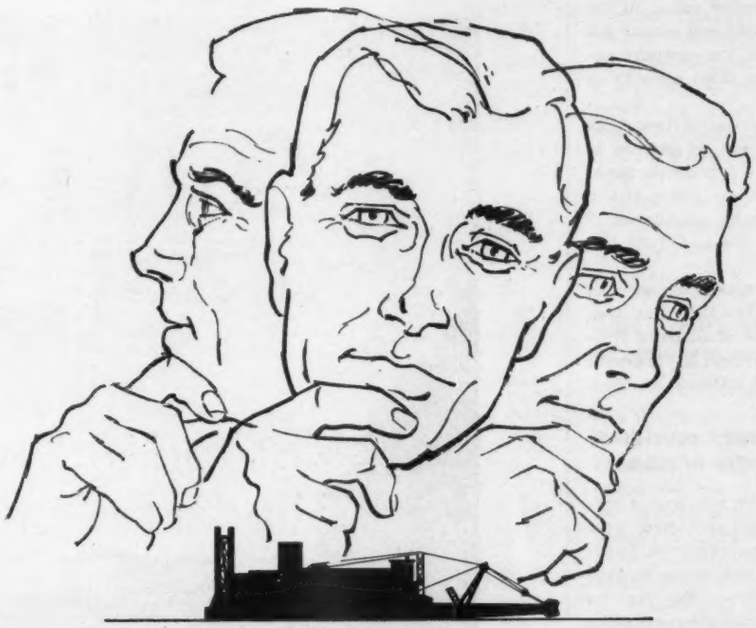
Gang sections

Four ganged sections were used, each measuring 20 feet wide and 28 feet high. This permitted crews to pour one-third of a tank at one time. Three trusses braced each ganged section. Six wales—made of 4-inch channel iron rolled to conform to the curvature of the tanks—were attached to the trusses. The trusses were securely fastened to the floor by anchor bolts cast in the slab.

Five permanent scaffolds were attached to the backs of the ganged units in order to speed up the removal of the tie ends and the placement of ties. Two pulleys were hung out over the face side of the gangs to be used in lifting equipment for the erection of outside forms. Ganged units consisted of four rows of Symons 6-foot forms and one row of 4-foot forms to make the 28-foot height. The forms were laid out so that special forms for floating cover and pipe haunches, which occurred only on the last tank, could be placed in the unit with a minimum of labor.

Each ganged form weighed about 4 tons. A Lorain ¾-yard crawler-mounted crane with 80-foot boom handled the forms. Crane time for moving all four gangs was four hours.

Friebel & Hartman purchased 18,000 square feet of Symons forms and rented 12,000 square feet to place a total of 5,300 cubic yards of concrete. The project is planned for completion in February, 1960. THE END



Checklist for Dredge Selection

Successful dredging operations require efficient use of time and labor, avoidance of downtime, and all-around capability of a dredge backed up by a builder of recognized merit. Before you buy a dredge, be certain that the builder qualifies on all of the following points. You must be assured that he has complete responsibility for the performance of your equipment.

	ELLICOTT	BUILDER A	BUILDER B
Is the dredge a 100% unified machine, designed and built by a single engineering source?	✓		
Does the builder *integrate* all the parts into a *balanced* construction tool?	✓		
Can he assure the performance potential of the completed dredge?	✓		
Are his equipment recommendations based on your specific job requirements?	✓		
Is he willing to take *complete* responsibility for field performance?	✓		

Come to Ellicott first for real evaluation of the factors you must consider—in your own interest—to insure a sound investment in the dredge best suited to your needs.

ELLICOTT MACHINE CORPORATION

1609 Bush Street, Baltimore 30, Maryland, U. S. A.

Subsidiaries: Dragues Ellicott France, Paris, France; Ellicott de Mexico, Mexico City, Mex.; Dragas Ellicott do Brasil Ltda., Rio de Janeiro, Brazil; Ellicott Fabricators, Inc., Baltimore, Md.; McConway & Torley Corp., Pittsburgh, Pa.

Successors to the floating dredge business of the Bucyrus-Erie Co. and the American Steel Dredge Co. Complete engineering sales and repair parts service.

3017

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Fred W. Argue, executive vice president of Stone & Webster Engineering Corp.

Top executives promoted by Stone & Webster

Fred W. Argue and Alfred L. Hartridge have been elected executive vice president and financial vice president, respectively, of Stone & Webster Engineering Corp., Boston and New York City. As senior officer in the Boston office, Argue will assume full responsibility for the executive coordination of the firm's activities in that area.

From headquarters in New York City, Hartridge will, in addition to his other duties, coordinate the financial activities of the firm's various domestic and foreign subsidiaries.

Both men are directors of the corporation.

Richard N. Benjamin, president of Stone & Webster, Inc., has been elected a director of Stone & Webster Engineering; and F. E. Conger has been named assistant secretary.

Vermilya-Brown president honored by the BCMBA

Charles A. Selby, president of Vermilya-Brown Co., Inc., New York City, has been honored by the Building Contractors and Mason Builders Association of Greater New York for his work during two successive terms as president of the association. The framed resolution was presented to him at a recent luncheon.

Highway engineers elect

Frederick Culver has been elected president of the Highway Engineers' Association of Missouri, succeeding John J. Leslie. Harold L. Lien, W. J. Eddlemon, and Roy F. Warner were elected vice presidents. J. J. Corbett was elected secretary-treasurer for the twenty-second time. The officers will serve a one-year term.

NBCA names coordinator

Charles R. Foster has been named technical coordinator of the National Bituminous Concrete Association. He will head the group's new national research effort toward getting better quality and control into the construction of bituminous-concrete paving of all types. Foster's chief responsibility will be to plan, promote, install, and coordinate individual research projects around the country.

Foster was formerly chief of the flexible-pavement branch, soils division of the U. S. Waterways Experiment Station at Vicksburg, Miss.

Wigton-Abbott elects

E. A. Verpillot, assistant to the president of Wigton-Abbott Corp., engineers and constructors of Plainfield, N. J., has been elected a director of the firm. Verpillot is a former deputy national housing expediter and deputy chief engineer of New York City's Department of Marine and Aviation.

Missouri engineers give award to Weber

A. Carl Weber, director of research engineering for Laclede Steel Co., St. Louis, Mo., has received the annual Outstanding Engineer Award from the St. Louis chapter of the Missouri Society of Professional Engineers. The award was presented at a joint meeting of the Professional Engineers and the Engineers' Club of St. Louis.

Weber has been instrumental in the design and standardization of steel joists, high-strength wire, and reinforcing bars, and has been responsible for the development of numerous designs of prefabricated reinforcement and high-strength steel.

New York Port Authority honors contract engineer

H. George Dacancq, contract administration engineer in the engineering department of The Port of New York Authority, was honored by his colleagues on his 30th anniversary with the bi-state agency. Decancq has been with the Port Authority since 1927, with the exception of 1940-41, when he worked for the United States government at the Panama Canal, and 1944 to 1946, when he served with the Seabees in the Pacific.

Decancq has worked on the George Washington Bridge and the Holland and Lincoln tunnels.

HMA elects officers

Milton L. Aitken has been elected president of the Hoist Manufacturers Association. At the same time, John S. Jackson was elected vice president, and Joe H. Peritz was re-elected executive secretary and treasurer. Carl O. Hedner, William C. Miles, and Raymond C. Blair were elected directors. C. M. Dinkins is general counsel.

Harold A. Cloud, assistant managing director of the American Concrete Pressure Pipe Association.

Concrete-pipe groups name three to new posts

Harold A. Cloud has been appointed assistant managing director of the American Concrete Pressure Pipe Association. He was formerly a research engineer for the Minneapolis Honeywell Regulator Co.

John G. Hendrickson, Jr., has been named director of engineering research of ACPPA and the American Concrete Pipe Association. He was previously research engineer for both associations.

ACPPA, ACPA, and the American Concrete Agricultural Pipe Association have appointed Marjorie L. Congleton assistant to the managing director for all three associations.

Aberthaw Construction elects top executive

David O. McKinley has been elected vice president to assume active management of Aberthaw Construction Co., Boston. In the construction field for the past 17 years, McKinley joined Aberthaw in 1955 as chief estimator and was later appointed vice president.

Col. Carlson to head Nashville district

Col. Vincent P. Carlson will, in July, become district engineer for the U. S. Army Corps of Engineers at Nashville, Tenn. He is presently commanding officer for the 160th Engineer Group (Combat), Fort Knox, Ky.

Col. Carlson will succeed Col. Eugene J. Stann, who will be assigned as the engineer to the Military Assistance Advisory Group in Vietnam.

Koehring Co. president honored by sales club

Julien R. Steelman, president of the Koehring Co., Milwaukee, has received the 1959 Outstanding Citizen Award of the Milwaukee Sales Executives' Club. High interest in civic affairs while guiding the expansion of a diversified industrial concern was cited as the reason for the choice.

Steelman, who is chairman of the board of the International Road Federation, has been president of the Construction Industry Manufacturers Association, the Power Crane & Shovel Association, and the American Road Builders' Association.

Engineering firm elects

Charles T. Main, Inc., engineering firm of Boston, Mass., and Charlotte, N. C., has elected Franklin P. Parker to serve as a director of the corporation.

Whiting-Turner promotes

Harold P. Cohn and Ralph P. Pass have been promoted to vice presidents of The Whiting-Turner Contracting Co., Baltimore, Md. Cohn, who has been with the general contracting firm for the past 12 years, was previously its division manager. He is an associate member of the American Society of Civil Engineers.

Another 12-year member of the firm, Pass had been Midwestern division manager prior to his new appointment.

AISC honors designer of steel-frame structures

Gen. Leif J. Sverdrup (U. S. A., ret.) has been presented with the Lloyd Kimbrough Medal by the American Institute of Steel Construction. The award was made for his outstanding achievement in the engineering and design of steel-frame structures. These include bridges in Missouri and Nebraska, airfields, the Saudi Arabian oil pipeline and auxiliary facilities, and the Arnold Engineering Development Center built for the Air Force in Tennessee.

The award was made at the AISC's eleventh national engineering conference held last month.

Gen. Sverdrup, an engineer-hero of World War II South Pacific jungle fighting, is now president of Sverdrup & Parcel, architects and engineers of St. Louis, Mo.

Catch-basin cleaner used as hydraulic crane

When new catch basins are included in any of the country's road-construction contracts, generally the contractor must clean them before final acceptance of the job. Suburban Excavating Co., Wakefield, Mass., decided to try a Stetco catch-basin cleaner for one of its jobs.

The truck-mounted device cleans basins by means of a double-acting orange peel or clamshell bucket. Suburban Excavating also used the equipment, minus the bucket, as a one-ton hydraulic crane for pipes, curbs, poles, or general maintenance. The cleaner operates through a power-takeoff driven by the truck engine.

GMC OPERATION "HIGH GEAR"

brings you the eatest money-saving, money-making construction trucks ever built!

Operation "High Gear" is the biggest engineering, design and quality-control program ever known! It's an entirely new concept in modern truck transportation, backed by the keenest brains and manufacturing know-how in the business! Results: New truck values, new dependable endurance, new low operating and upkeep costs. See your GMC Dealer for proof, today. GMC Truck & Coach —a General Motors Division.

W! LASTING LOW-COST POWER

can get the most economical diesel in any truck—the new GMC 6-71SE two-cycle ant. This fuel-saving champ has exclusive range governor and automatically controlled ilable with 189 or 210 H.P. Other GMC clude economical, powerful V-8's and Sixes.

NEW! TRUE-TRUCK FEATURES

For the rough, tough usage of construction trucks, GMC has installed strongest front crossmembers, new extra-heavy-duty clutches, bigger brakes and stronger prop shafts. In many models you also get these GMC Extra-Value features at no extra cost—M-400 bearings that last seven times longer, standard synchromesh transmissions and the easiest mechanical steering, recirculating ball-type.

SPECIALIZED CONSTRUCTION MODELS

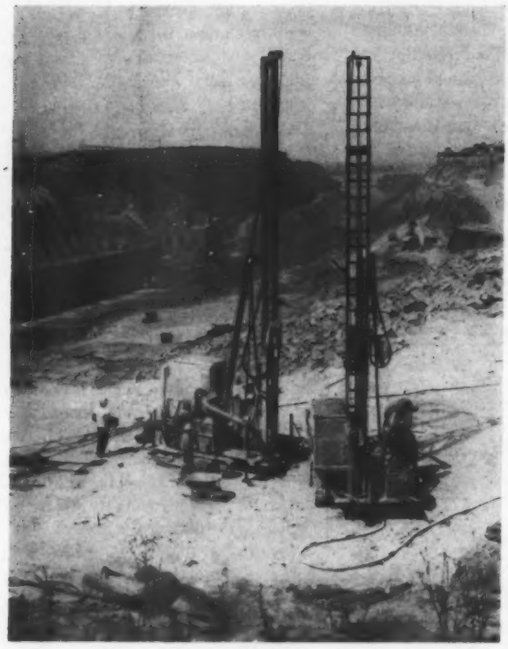
any shape! Conventional and COE design, world's biggest selection of ers, complete line of pickups including new Wide-Side and 4 x 4 models, 50 six-wheelers with 46,000 lbs. GVW designed specifically for 6-7 yard nd 10-cubic yard dumps even in states with 32,000-lbs. axle laws, plus l off-highway models with up to 63,000 lbs. GVW.

GMC GENERAL MOTORS CORPORATION TRUCKS

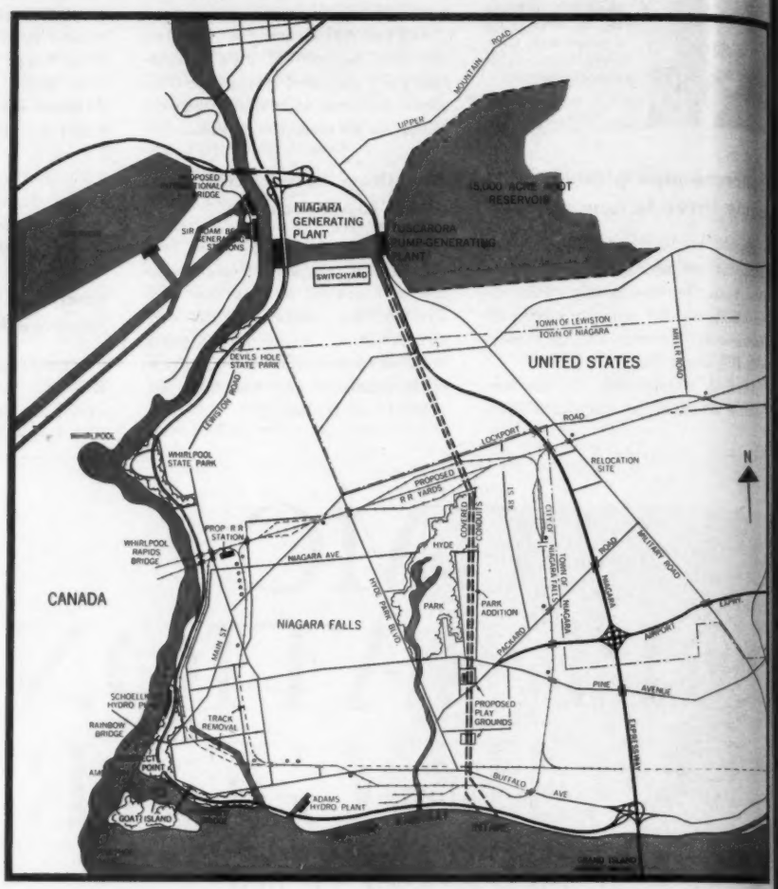
h for more great truck advances from GMC!

From ½-ton to 45-ton . . . General Motors leads the way!

For more facts, use Request Card at page 18 and circle No. 209



Two of the seven Joy Challenger drills that are the real muscle of the drilling fleet sink 4 to 4½-inch holes 30 feet deep into a bench. They are working in the south abutment area of the Niagara generating plant. In the background, on the Canadian side of the river, is the Sir Adam Beck power plant.



Air from the 10-inch line is tapped by flexible lines leading to drills on lower benches. These Gardner-Denver Air Tracs work on a pattern varying from 8×8 to 14×14 feet, depending on the rock. International Payhaulers are rolling by on their way to a shovel.

Benches carved from cliff to seat Niagara powerhouse

Massive equipment fleet works round the clock to move 36,000 to 40,000 yards of rock daily

by ANTHONY N. MAVROUDIS
field editor

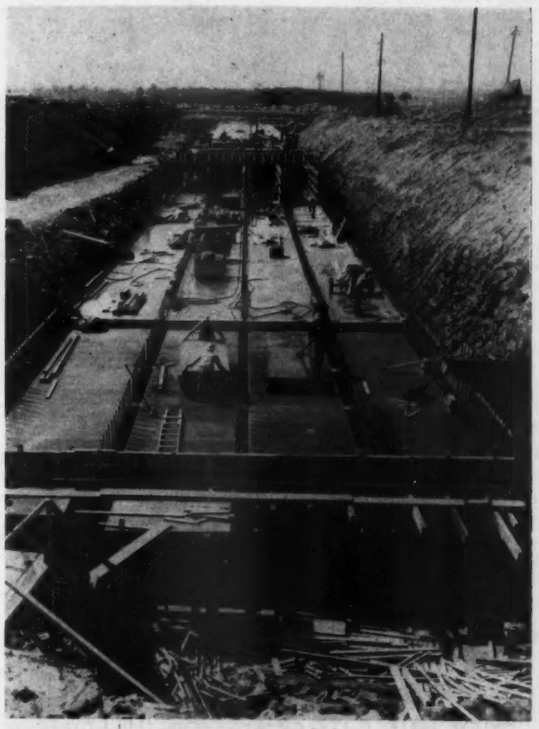
Three Lima 2400 shovels with Amsco 6-yard buckets work on different benches to load out blasted rock. The shovel in foreground loads a Euclid 18-yard end-dump. Excavating these huge benches down the escarpment in the powerhouse area requires 6,700,000 yards of excavation.

A Euclid, right, and an International Payhauler dump rock from the generating-plant excavation to the spoil area in the town of Lewiston. The spoil area will be developed into a park overlooking the Niagara River.

Haul rigs are dwarfed by the spoil area, which is being built up into a series of terraces. Natural ground elevation is plus 360 feet; the broken rock here forms a terrace at the 410-foot elevation. Other terraces at plus 440, 470, and 500 feet will be formed for the park.

Empty Payhaulers head back to the excavation on a 50-foot-wide haul road. Two haul roads at different levels link the spoil area, some 1¾ miles downstream from the plant site, with ramps at the various bench levels in the excavation. Haul rocks were blasted out of the sides of the cliffs.

Crushed rock for maintenance of the 3½ miles of haul road pours out of this crushing setup. Two Cedarapids crushers, set in tandem, chew the rock to size. An International TD-24 feeds the crushers; at the other end of the line, an end-dump picks up a load of the crushed rock.



An early start on concrete operations is assured. Crews are preparing plywood forms for the power and control tunnel, which will be placed in three sections. The bottom slab will be placed first; the middle and wall partitions will be placed monolithically; and the roof and wall slabs will also be placed monolithically.

(Additional photo on front cover)

Rock is being carved from a 400-foot cliff at a rate of 36,000 to 40,000 cubic yards in 3 shifts per 24-hour day to shape the location for the Niagara generating plant, largest single contract awarded for the Niagara Power Project.

For over a year, Merritt-Chapman & Scott Corp., New York, N. Y., the contractor on this $99 million contract, has been working around the clock so that concreting operations can start this season.

Benches used

M-C&S has been concentrating excavation operations at two locations. The powerhouse area is being shaped by crews cutting a series of huge benches down the escarpment along a 2,000-foot-long area. This involves about 6,700,000 yards of excavation. The second operation involves the construction of the forebay area, which requires over 2,360,000 cubic yards of excavation. This 1,000-foot-long forebay is being formed immediately north of and adjacent to the proposed intake structure at the top of the escarpment.

Crews began excavation at the top of the escarpment, at an elevation of plus 575 feet, by cutting 80-foot-wide benches in 30-foot lifts along the face of the cliff. These benches were connected by carved-in-rock ramps so that equipment and men could get to the lower benches.

This benching involved drilling, blasting, digging, and hauling along the various levels until the men reached the base of the cliff, at elevation plus 200 feet. M-C&S left the existing rock along the water line at elevation plus 298 feet to form a natural cofferdam since the river level is about plus 250 feet. This will permit work on the powerhouse base to be done in the dry; later, the rock cofferdam will be removed. A gantry crane will ride rails, laid at elevation plus 200 feet, along the inside face of the natural cofferdam.

Large drill fleet

Merritt-Chapman is using seven Joy Challenger drills, seven Gardner-Denver Air Tracs, and Boom-Tracs, four Gardner-Denver Model HT-143 drills and four Joy wagon drills to drill the 30-foot bench lifts. The backbone of the drilling fleet is the seven Joy Challenger and four Gardner-Denver HT-143 rigs, which bore 4 or 4½-inch-diameter holes 30 feet deep without a steel change. The drill pattern varies from 8 × 8 feet to 14 × 14 feet, depending on the geological makeup at the various levels.

An average 30-foot drill hole is loaded with Atlas, Du Pont or Olin explosives for about 21 feet, and up to 16 millisecond delays are used per blast. These delays control the blast, which progresses from the bench face toward the river. M-C&S is averaging a cubic yard of blasted rock for every 0.7 to 1.0 pound of explosive used. The Atlas explosives consist of Amacor C and 40 per cent extra. The Du Pont charges are Red Cross 40 per cent and Hi-Cap. Olin explosives consist of 40 per cent special dynamite and Olinite D.

The contractor powers the major portion of the pneumatic equipment on the job, including the drills, with three Joy WN-224 air compressors. These semiradial, 4-cylinder, water-cooled 2-stage compressors are driven by Westinghouse 600-hp electric motors housed in the Republic Steel metal compressor building. Each compressor has a Joy P12 after-cooler, equipped with moisture expellers, located outside the 30 × 60-foot compressor building.

From the two air receivers, also located outside, the air is fed to a 12-inch-diameter line that runs into a 10-inch air line laid along the top of the escarpment. Flexible air lines tap air from the line to supply the drill rigs working on the lower benches.

Spoil area

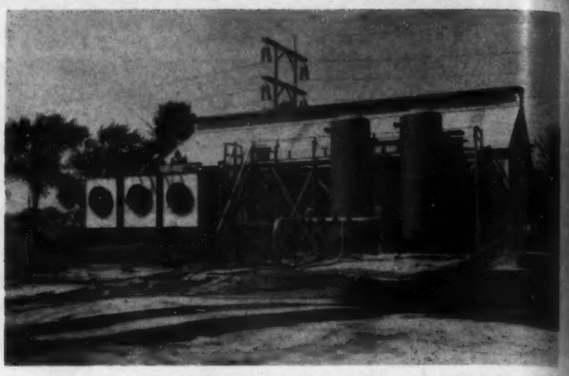
This tremendous amount of rock excavation is being hauled to a 1,500 × 3,000-foot spoil area located about 1¾ miles downstream from the project site. Two 50-foot-wide haul roads connect the spoil area with the excavation by means of ramps to the various bench levels. A spotter, located at each of the two haul roads, directs returning haul units to the various benches. This prevents a jam of haul rigs at one shovel location and a lack of haulers in another spot.

The spoil area, located in the town of Lewiston, eventually will be developed into a park overlooking the Niagara River. The area's existing elevation is plus 360 feet, and terraces are being formed at elevations plus 410, 440, 470, and 500 feet for the park.

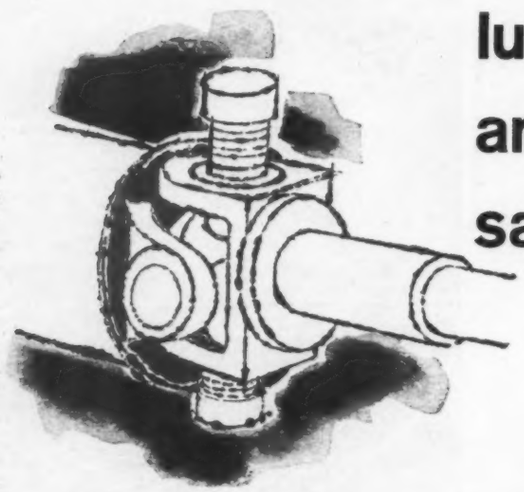
Merritt-Chapman is using 42 Inter-

(Continued on next page)

A 4-drill Ingersoll-Rand rig, working in the intake area, uses D-45 drills on 26½-foot towers that handle 20-foot steels. The rig puts down four holes, then shifts 9 inches to drill another set. Drills are on 18-inch centers.



Air for all equipment is supplied by compressors in this compressor house fabricated with Republic Steel panels. Three Joy after-coolers with moisture expellers are mounted outside, left; two air receivers are at right.



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Sinclair Litholine Multi-Purpose Grease

For more facts, use Request Card at page 18 and circle No. 210

(*Continued from preceding page*)

national 18-yard Model 95 Payloaders; 20 Euclid 66TD 18-yard rear-dumps; and six Euclid 63TD 14-yard rear-dumps to handle the hauling assignment from the powerhouse and forebay areas.

These rigs are loaded by five Lima 2400 shovels equipped with Amsco 6-yard buckets, a Bucyrus-Erie 54-B and a Marion 111-M. A large tractor fleet consisting of 11 International TD-24's, a Caterpillar D9, four D8's and two D7's, is used to spread and level the spoil area and to shape the benches being excavated.

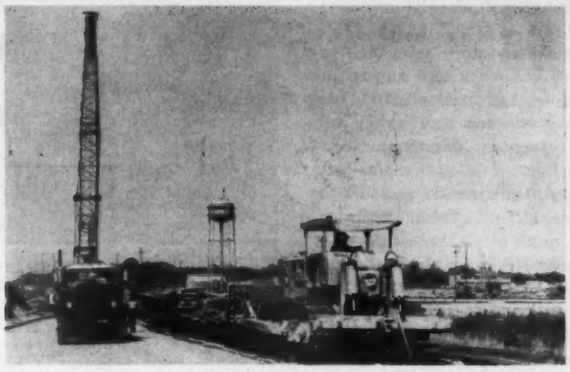
The contractor has set up a portable crushing unit along the main haul road to produce crushed stone for the haul roads. Maintenance of these heavily traveled surfaces requires continual replacement of stone. This plant includes two Cedarapids portable crushers set up in tandem and having an end conveyor to load the trucks. This operation assures the contractor of a constant supply of stone for the haul roads.

Preparatory work

Before excavation operations could actually get under way in the forebay and powerhouse areas, M-C&S had the job of relocating many existing facilities. Lewiston Road, for instance, ran across the area of the proposed intake structure at the top of the escarpment. A section of this road was relocated east of its original alignment so that it was in the forebay area. A bridge, built in the new alignment, permitted the haul road from the forebay area to the spoil area to run under the roadway section. This eliminated the need for haulers to cross a heavily traveled vehicular route, which would have involved long delays.

Other existing facilities which required relocation were water lines, sewers, telephone cables, New York Central railroad tracks, and transmission power lines running from Canada's Sir Adam Beck powerhouse directly across the river. The relocation of the transmission lines, which required the erection of permanent steel towers, was one of the first jobs handled. After the new transmission towers were erected, a helicopter was

In the forebay area, which requires about 2,360,000 yards of excavation, a Marion 111-M shovel loads out to a Payhauler. International TD-24 tractor-dozers assist the shovels. The haulers are directed to the various benches by spotters to prevent a jam or a lack of rigs at any one shovel location.



Relocation of roads and utilities was an early job. The Cat D9 tractor-dozer is ripping up the asphaltic pavement of Lewiston Road, which crossed the site of the proposed intake structure at the top of the escarpment. The P&H truck crane is used to pull guardrail posts.

used to carry a pylon across the river from the Sir Adam Beck powerhouse to the first tower on the American side. This pylon was then used to string and pull the new transmission cables across the river gorge.

Generating plant

The Niagara generating plant will consist of an intake structure at the top of the escarpment and a power plant at the bottom, with the two connected by concrete-encased steel penstocks. Each penstock will be 24 feet in diameter and 480 feet long. The reinforced-concrete, semi-outdoor-type powerhouse will be about 1,840 feet long. Thirteen generating units, each of 150,000-kw capacity, will be installed.

The plant intake will be a reinforced-concrete gravity structure about 1,100 feet long. Each of the 13 unit intake blocks will contain a 200,000-hp hydraulic turbine with a steel scroll case and concrete draft tube. The plant will have a permanent 630-ton-capacity gantry crane to handle the turbine and generator assemblies; a 30-ton gantry over the draft-tube gates; and a 90-ton gantry to handle

(*Continued on next page*)

Contract quantities

Powerhouse length	1,840 ft.
Total distance (face of intake to downstream face)	550 ft.
Total height (intake deck to tailrace)	376 ft.
Capacity (total)	1,950,000 kw
13 turbines (each)	200,000 hp
13 generators (each)	150,000 kw
Turbine runner (approx.)	17 ft. dia.
Generator rotor (approx.)	34 ft. dia.
Generator shaft (approx. 112,000 lbs.)	50 in. dia.
Penstocks (480 ft. long)	24 ft. dia.
Excavation, unclassified	9,750,000 cu. yds.
Concrete	1,079,500 cu. yds.
Cement	1,280,000 bbls.
Reinforcing steel	60,000,000 lbs.
Trash rocks, gates, cranes, and guides	13,600,000 lbs.
Prestressed-concrete beams	37,100 linear ft.

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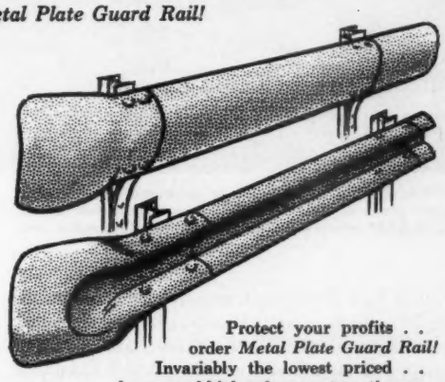
Sandy Warner is featured in "Some Like It Hot," with Jack Lemmon, Marilyn Monroe and Tony Curtis, a United Artists release now showing!



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(*Continued from preceding page*)

the intake structure gates. The intake structure will also support the permanent Lewiston Road and the proposed Niagara Parkway on two levels across the downstream face.

The initial installed name-plate capacity of the Niagara plant will be 1,950,000 kw; with the 12 generator-motor units of the Tuscarora plant producing 240,000 kw, the total name-plate capacity for the entire Niagara Power project will be 2,190,000 kw.

Merritt-Chapman's construction operations on the Niagara generating plant are under the supervision of G. G. Werner, Jr., vice president. H. S. Booth, the project manager, heads the field staff, which includes E. W. Simpson, general superintendent; C. L. Mason, project engineer; and John C. Babson, office engineer. William Denny, executive vice president of M-C&S' Construction Department, is in over-all charge of construction on Merritt's two jobs on the Niagara Power Project.

Walter H. Latham is the resident engineer for the New York State Power Authority, and J. P. Ottesen is the project manager for Uhl, Hall & Rich, Boston, Mass., the consultants for the Authority.

THE END

Motorola names managers

Robert F. Davis has been appointed manager of two-way radio sales for Motorola Communications & Electronics, Inc., a subsidiary of Motorola, Inc., Chicago. In his newly created post, Davis will be in charge of sales of two-way communications products to public-safety, industrial, commercial, and transportation organizations in a 13-state area bounded by North and South Dakota, Nebraska, Kansas, Missouri, Kentucky, and Ohio.

Davis' former post of regional manager is now held by Eric Goleas. He will serve northern Illinois, northeastern Indiana, eastern Wisconsin, and Michigan's Upper Peninsula.

Both men will have offices in the Midwest Area headquarters in Chicago.

PCA promotes three

Joseph A. Leadabrand has been appointed assistant to the vice president for promotion of the Portland Cement Association. He succeeds Thomas E. Long, who has been named Eastern regional manager.

In his new position, Leadabrand will report to James D. Piper, who supervises the association's promotion activities in its general headquarters in Chicago, and in six regional and 33 district offices throughout the United States and in British Columbia, Canada.

E. Guy Robbins replaces Leadabrand as acting manager of the Soil-Cement Bureau. Robbins joined the association in 1937 as soils-testing engineer, and has since served as research engineer, soil-cement field engineer, and senior paving construction engineer.

STRETCHED OUT TO ITS FULL 66-FOOT LENGTH, this trailer built by Trailmobile, Inc., Cincinnati, will transport heavy transformers for a Spanish utility company, Hidroelectrica Espanola, S. A. The 32-tire all-steel cradle-frame unit is capable of carrying loads up to 300 tons. The trailer is steered like a hook-and-ladder fire engine, with drivers at both front and rear. It is so long that operators use a two-way telephone to keep in touch with each other.

engine power
BY CATERPILLAR

THIS PORTABLE PLA S
ANYWHERE WITH C IES

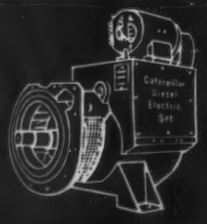
Power for A. & E. Paving Company's continuous-mix portable bituminous plant is furnished by three Caterpillar Diesel Engines. A D342 powers the crusher directly through a universal joint and shaft. All conveyers and four deck scr run by a Cat D318 Electric Set. The hot plant—now se tons of bituminous mix per hour—is powered by a

THIS is A. & E. Paving Company's continuous-mix portable bituminous plant. Headquartered at Arcata, California, the combination crusher, dryer and hot plant can operate anywhere from Arizona to British Columbia without regard for availability of other power sources. When it was time to select his type of electric power for the spread, president Sam Parnum chose Caterpillar Portable Electric Sets with good reason.

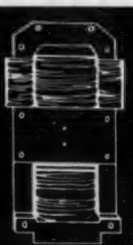
Working anywhere within so vast an area, he wanted absolutely dependable power. He wanted sure of nearby service anywhere the plant moved get full production and power protection, he had to units that would deliver the power wherever they

When you outline portable plant requirements this, the answer is Caterpillar. They *are* depen under all conditions. Wherever you take them, always close to a Caterpillar Dealer, his staff of sp ists and any part you'd ever need. And your ne

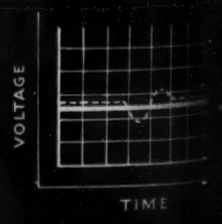
Cat Generators are self-regulated, compact, simple to operate. They're quality built for long life.

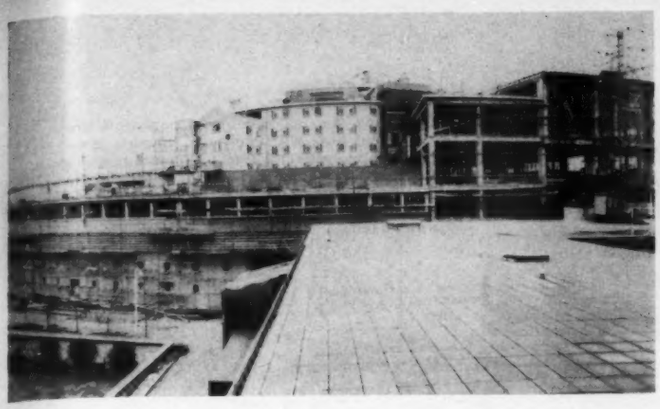


There are no moving parts in the generator regulator. Voltage is steady from no-load to full load.



Electric motor starting ability is ex —and there's capacity to han surge of heavy loads.





The B.B.C. television center in London is the first of its kind in the United Kingdom. The inside circular 7-story main office block, background, has seven ground-floor studios radiating from it.

London television center to be Europe's largest

The new B.B.C. television center, now being built in London, will be the biggest and most modern television headquarters in Europe. It will also be the first of its kind in the United Kingdom to be built expressly for producing television programs.

Located on a 13-acre site at Shepherds Bush, Hammersmith, the center will consist of a vast circular main block containing seven studios and several hundred offices; a scenery block; a restaurant block; a maintenance block; and eventually a "spur" running from the main block.

The circular main block will have a 7-story inner ring around a circular central garden. Outside this high ring and radiating from it will be seven ground-floor studios. Between two of the studios there will be a wedge-shaped multistory control block. Around the periphery of the studios will be a runway for transporting scenery and properties from the scenery block.

One of the largest studios will be 108×100×54 feet high. It will have a 7-foot 6-inch-deep pit into which part of the floor can be lowered. The pit can be filled with water for use in aquatic programs.

The scenery block is completed. The partially completed restaurant block will, when in use next year, be able to serve 750 diners at one sitting and will be connected to the main block by a 2-story bridge and a tunnel.

The cost of building the main block, maintenance block, and completion of the restaurant block will be about $16,800,000, not including technical plant and wiring.

Unemployment tax change

To the Editor:

. . . Your February article on the Federal Unemployment Tax on page 127 should state 4 or more persons, instead of 8 or more. This law was changed in 1956 . . .

(Name withheld)
G. A. & F. C. Wagman, Inc.,
Dallastown, Pa.

Photogrammetry discussed in new HRB bulletin

Seven papers on "Photogrammetry —Developments and Applications: 1958" are contained in the Highway Research Board's Bulletin 199.

Information is supplied on the adjustment of state plane coordinates; survey security through photogrammetry; earthwork data procurement by photogrammetric methods; a 10-foot portable subtense bar; aerial mapping in areas of heavy ground cover; photographic targets for markers of survey control; and photogrammetric map accuracy.

Tables, graphs, formulas, and diagrams abound in the bulletin. A bibliography appears at the end of some chapters.

Priced at $2, the bulletin may be obtained from the HRB, 2101 Constitution Ave., Washington 25, D. C.

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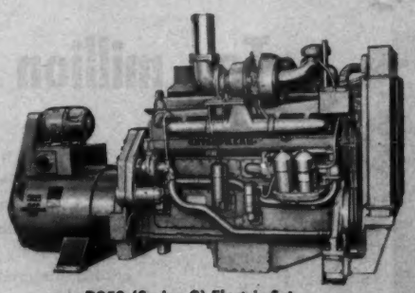
PLA SURE OF POWER
I DIESEL ELECTRIC SETS



D353 (Series C) Electric Set

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Engine Division, Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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Each of these features is a buying advantage . . . you get them all in a Cat Electric Set

- Lowest over-all cost per operating hour
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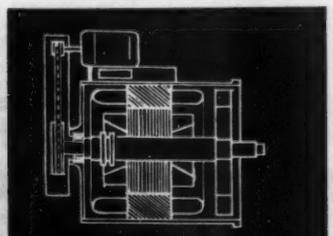

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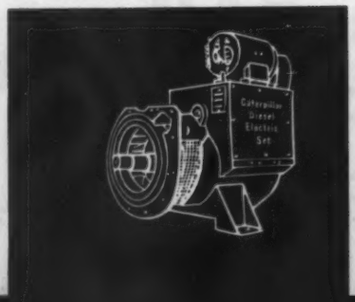

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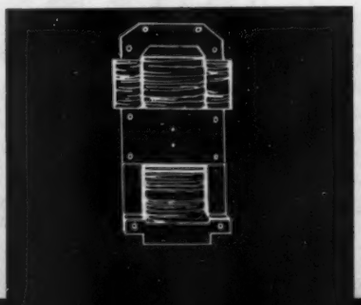

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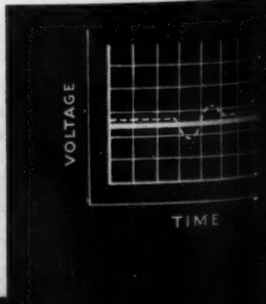

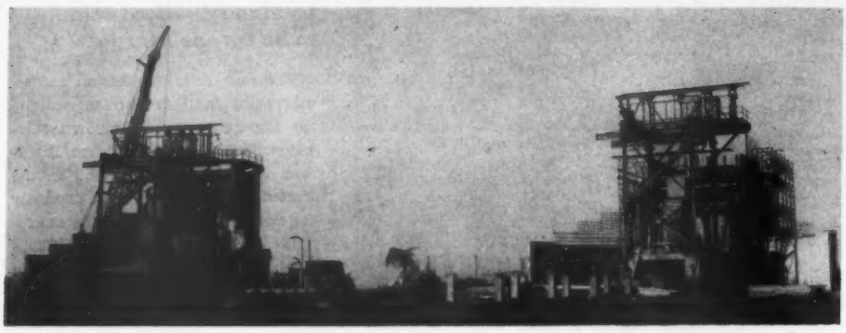

The planning and building of the aggregate production plant that will supply the Niagara Power Project with more than 7,300,000 tons of rock and 3,100,000 tons of sand was a project in itself. The two primary crusher buildings are being built at this point, with a Manitowoc crane working on the one at the left.

This is one of the primary crusher buildings, with a Cedarapids 53×60-inch impeller impactor and a 60-inch×25-foot apron feeder. Wing walls are built around the feeder location to support the 40-foot-high berm used by haul rigs charging the crushers. Conveyors bring the material to a surge pile.

Niagara Power Project contractors learn to build world's largest engineered plant to produce

Ten million tons of aggregate

What is believed to be the largest aggregate-producing installation ever built—an installation capable of turning out, every hour 2,000 tons of graded material from 6-inch stone to sand—is now in full production, furnishing all the aggregate required by contractors on the Niagara Power Project.

Part of contract

The aggregate plant was erected and is being operated by Channel Constructors, a joint venture of Peter Kiewit Sons' Co., Omaha, Nebr.; Perini Corp., Framingham, Mass.; Morrison-Knudsen Co., Inc., Boise, Idaho; and Walsh Construction Co., New York, N. Y. Kiewit is the sponsor.

The material that will be used to supply the aggregate plant is being excavated from the 3,000-foot-long open channel connecting the Tuscarora pumping-generating plant with the intake of the Niagara generating plant at Lewiston, N. Y.

The canal, about 500 feet wide along the straightaway and 1,000 feet wide at the forebay areas, will require about 100 feet of rock excavation after 10 feet of overburden is removed. This overburden, which will be used for the impervious core of the reservoir dikes, is only about one-third of the quantity required. The remaining core fill will be furnished by the conduit contractors, who will waste their excavation in the reservoir area to be later used by Channel Constructors. The rest of the dike fill is being produced by the aggregate plant.

Over 7,300,000 tons of rock and 3,-

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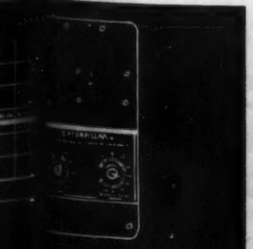

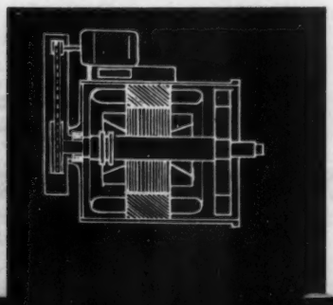

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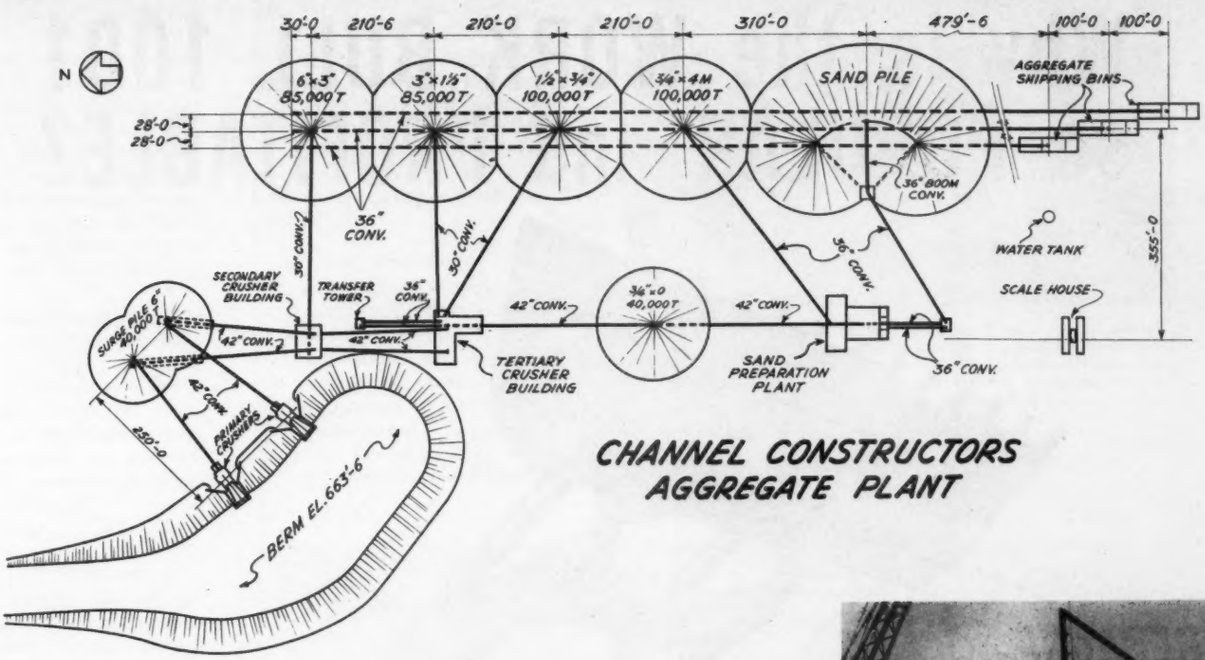

CHANNEL CONSTRUCTORS AGGREGATE PLANT

duced by the plant for the entire Niagara Power Project, which will require an estimated 3,300,000 cubic yards of concrete. To produce this concrete, about 5,500,000 tons of aggregate will be required.

Quick setup time

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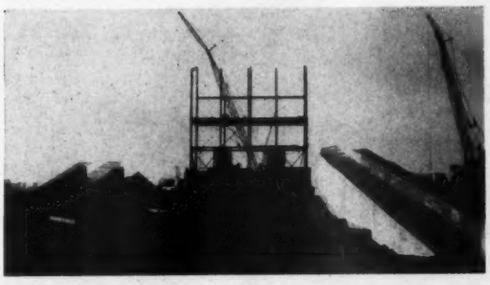

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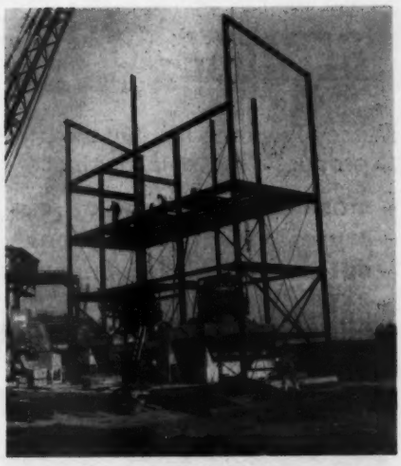

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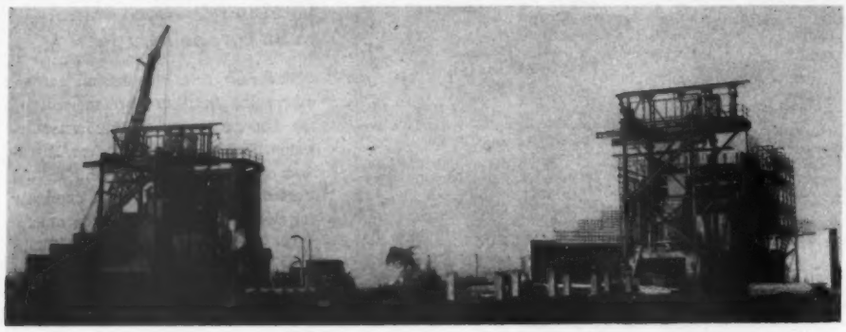

The planning and building of the aggregate production plant that will supply the Niagara Power Project with more than 7,300,000 tons of rock and 3,100,000 tons of sand was a project in itself. The two primary crusher buildings are being built at this point, with a Manitowoc crane working on the one at the left.

This is one of the primary crusher buildings, with a Cedarapids 53×60-inch impeller impactor and a 60-inch×25-foot apron feeder. Wing walls are built around the feeder location to support the 40-foot-high berm used by haul rigs charging the crushers. Conveyors bring the material to a surge pile.

Niagara Power Project contractors learn to build world's largest engineered plant to produce

Ten million tons of aggregate

What is believed to be the largest aggregate-producing installation ever built—an installation capable of turning out, every hour 2,000 tons of graded material from 6-inch stone to sand—is now in full production, furnishing all the aggregate required by contractors on the Niagara Power Project.

Part of contract

The aggregate plant was erected and is being operated by Channel Constructors, a joint venture of Peter Kiewit Sons' Co., Omaha, Nebr.; Perini Corp., Framingham, Mass.; Morrison-Knudsen Co., Inc., Boise, Idaho; and Walsh Construction Co., New York, N. Y. Kiewit is the sponsor.

The material that will be used to supply the aggregate plant is being excavated from the 3,000-foot-long open channel connecting the Tuscarora pumping-generating plant with the intake of the Niagara generating plant at Lewiston, N. Y.

The canal, about 500 feet wide along the straightaway and 1,000 feet wide at the forebay areas, will require about 100 feet of rock excavation after 10 feet of overburden is removed. This overburden, which will be used for the impervious core of the reservoir dikes, is only about one-third of the quantity required. The remaining core fill will be furnished by the conduit contractors, who will waste their excavation in the reservoir area to be later used by Channel Constructors. The rest of the dike fill is being produced by the aggregate plant.

Over 7,300,000 tons of rock and 3,100,000 tons of sand are being pro-

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Below, Model 18KT packing down sub-base materials on a road-widening job.

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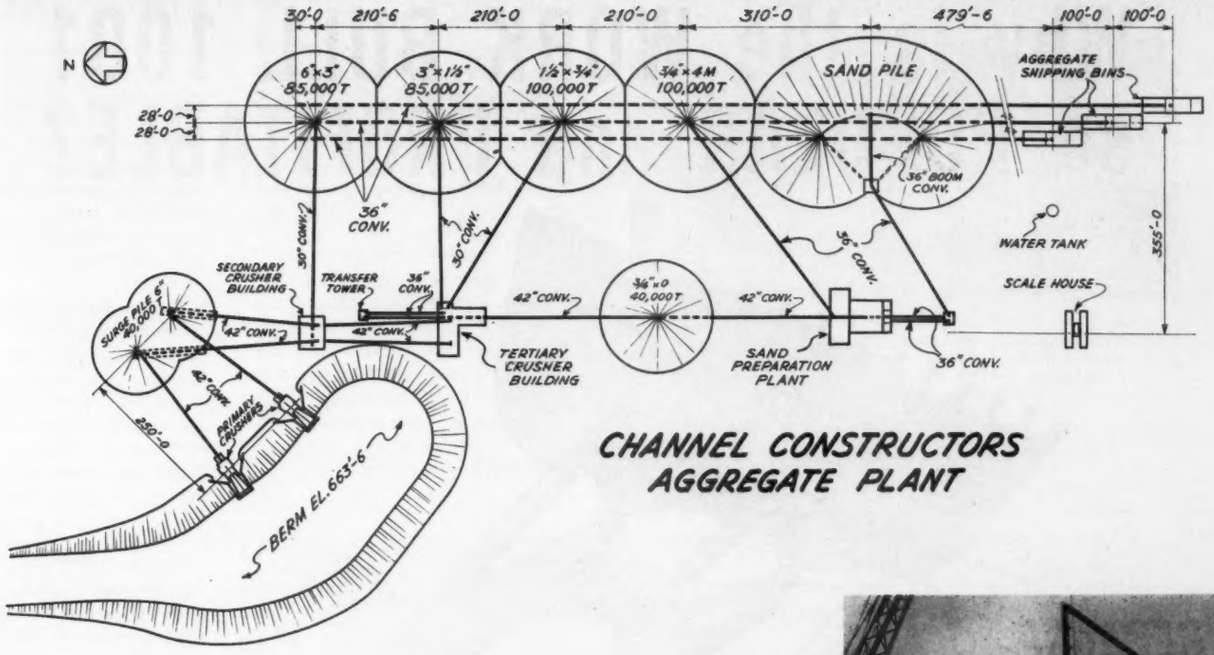

CHANNEL CONSTRUCTORS AGGREGATE PLANT

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Quick setup time

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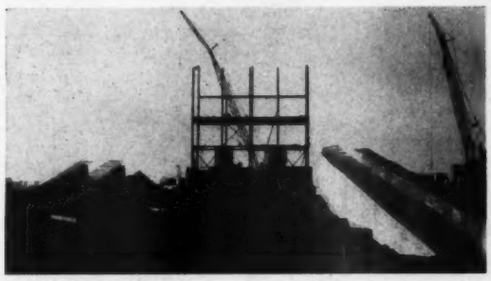
(Continued on page 25)



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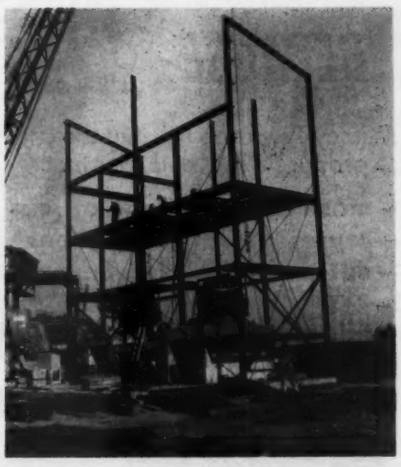

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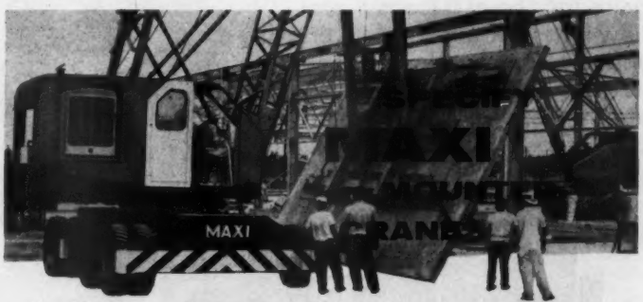

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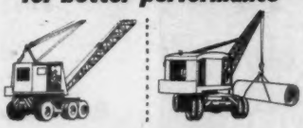

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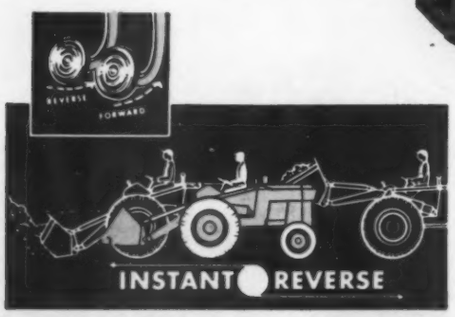

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(Continued from page 23)

Manufacturers of aggregate-plant equipment were given the delivery schedule so that, as foundations and structural-steel supports were completed, they made the equipment available for installation. The plant was ready for production by December, when the contractor began building up the huge aggregate stockpiles for this season's concreting operations.

Plenty of time was required to build up the five main stockpiles consisting of 85,000 tons of 6-inch stone; 85,000 tons of 3-inch stone; 100,000 tons of 1½-inch stone; 100,000 tons of ¾-inch stone; and 180,000 tons of sand. Each of the stockpile sizes is graded down to the next smaller size, which is the maximum size of the adjacent stockpile.

Plant layout

The plant has two Cedarapids primary crushers, consisting of Model 5360 H impeller impactors and 60-inch×25-foot apron feeders that are charged from a 40-foot berm by 30-ton side-dump wagons. About 26 of the TD-3040H hydraulic side-dump semitrailers manufactured by the Easton Car & Construction Co., Easton, Pa., are being used to haul the channel excavation to the primary crusher buildings. Another ten units are in reserve. Euclid tractors provide the motive power for the side-dumps. All the 6-inch-minus material from the primary crushers is discharged into a 40,000-ton surge pile by two 42-inch conveyors. A pair of reinforced-concrete reclaiming tunnels, positioned about 45 degrees with the primary crusher conveyors, use two 42-inch conveyors to transfer the surge-pile aggregate to the secondary crusher building.

The secondary crusher building houses four 6×16-foot Hewitt-Robins double-deck vibrating screens and two Symons-Nordberg 5½-foot standard cone crushers. Here, the surge pile aggregate is reduced and separated into two classifications. Everything from 6 to 3 inches is picked up by the 30-inch belt of the first inclined stockpiling conveyor, which runs at right angles with the secondary crusher building. All the remaining aggregate, which passes the 3-inch screen, is transferred by a pair of 42-inch conveyors to the tertiary crusher building 227 feet away.

This setup has six 6×16-foot single screens; two Symons-Nordberg 7-foot short-head cone crushers; and two 42-inch feeders. At this point, the aggregate is further reduced; 30-inch conveyors then transfer all material between 3 inches and 1½ inches to the second stockpile, and material from 1½ inches to ¾ inch to the third stockpile. A transfer tower between the secondary and tertiary crusher buildings is connected to the tertiary building by two 36-inch return conveyors. This provides the flexibility needed to control the amount of material produced for the two 3×1½-inch or 1½×¾-inch stockpiles. All the material passing the ¾-inch screen in the building is picked up by a 42-inch conveyor and deposited in a 40,000-ton surge pile 355 feet from the tertiary crushers. Another 42-inch conveyor in a reclaiming tunnel transfers this ¾-inch-minus material to the sand preparation plant 325 feet from the surge pile.

Sand preparation

The sand preparation plant consists of eight Hewitt-Robins 6×16-foot double-deck vibrating screens, four Eagle 44-inch × 32-foot sand screw classifiers, four Eagle 28-foot sand scalping tanks, two Allis-Chalmers 9½×13-foot rod mills, eight 36-inch feeders, and eight 24-inch feed-

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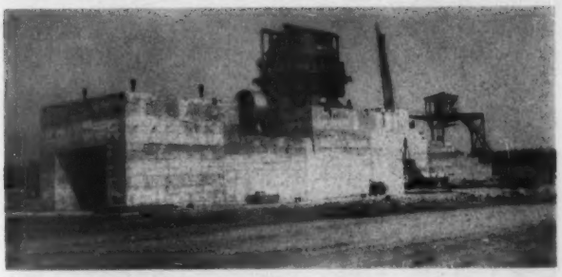
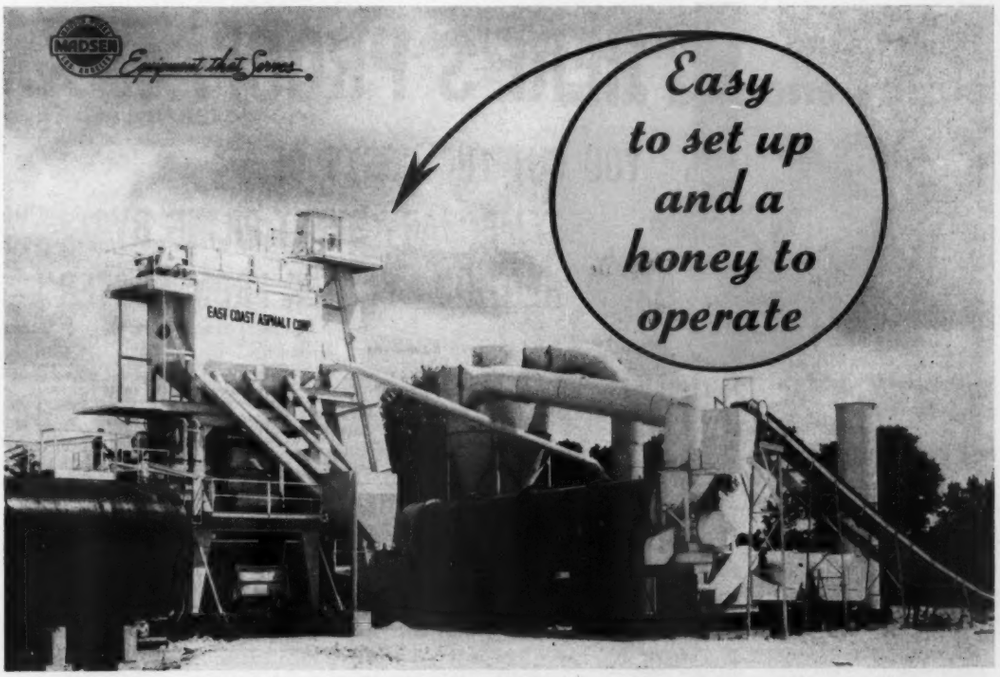


Some 227 feet from the secondary building is the tertiary crusher. One of the two Symons-Nordberg 7-foot short-head cone crushers is already installed. Six single-deck screens will separate incoming aggregate for two stockpiles, the crushers, and the conveyor leaving the building.



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This plant is capable of producing up to 200 T.P.H. on a 45 second charge-mix-discharge cycle.

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Complete box-like unit sections are built for transport on the highways. All major components may be wheel-equipped at the factory or in the field.

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MADSEN Twin-Shaft PUG MILL MIXERS—
Combined with Madsen Asphalt Pressure Injection System (Patented) to provide the fastest and most thorough mixing action known to the industry.

ROLL-AWAY WEIGH-BOX—
Exposes mixer for fast, easy servicing of mixer tips and shanks.

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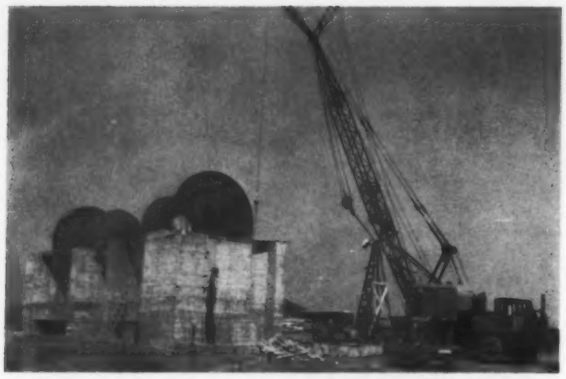

A Lorain truck crane assists in erecting the two Allis-Chalmers 9½-foot × 13-foot rod mills in the sand preparation building. Also housed at this location are 8 double-deck screens, 4 Eagle classifiers, 4 Eagle scalping tanks, and 16 feeders.

ers. All the material between ¾-inch and 4M sieve sizes, transferred from the intermediate surge pile and the rod mills, is picked up by a 36-inch conveyor and deposited in the 100,000-ton ¾-inch × 4M stockpile.

Everything passing the 4M screen falls into the Eagle classifier, which in turn deposits the proper sand sizes into the scalping tank. Here, the required gradation of sand is obtained and drawn off, and the suspended silt in the material is eliminated. A transfer tower, located about 92 feet in front of the sand preparation building, has three 36-inch-wide conveyors to handle material leaving the sand plant.

One conveyor is used to return material to the rod mills for additional reduction, while the other two belt conveyors transfer sand to the 36-inch stockpiling conveyor. This 36-inch conveyor end-dumps onto a 36-inch 117-foot-long swing-boom conveyor, which actually deposits the sand onto the 180,000-ton sand stockpile.

Reclaiming tunnels

Running beneath the five main stockpiles are three rows of reclaiming tunnels, each over 1,000 feet long, on 28-foot centers. Commercial Shearing tunnel liner plates, fastened by more than 120,000 bolts, form the 8-foot-high tunnels. The plates were assembled into tunnel lengths and positioned on the concrete reclaiming-tunnel floor; then the bottoms of the tunnel sections were tucked into grooves formed in the slab.

Each reclaiming tunnel houses a 36-inch-wide conveyor, equipped with safety wire trips, which can be shut down automatically in case of an accident or malfunction. As an important safety feature of the plant, all the conveyors are electrically interlocked; whenever any conveyor is shut down as an emergency measure, all the conveyors behind it are also automatically stopped. This prevents the continuation of aggregate production leading to the point of shutdown.

Two electrically operated feeder gates, built into the reclaiming tunnels under each stockpile, permit conveyor belts to be charged. Each of the three reclaiming-tunnel conveyors feeds a 5-compartment aggregate shipping bin equipped with three 6×16-foot double-deck screens. The screens separate the various aggregate sizes into specific bin compartments, which are equipped with double-gated Gar-Bro feeder gates for truck loading. After loading, the batch trucks have to pass a scale house so that the amount of aggregate leaving the plant can be weighed.

Over 10,000 linear feet of Goodyear conveyor belt was required for the entire plant. Wagner Electric and U. S. Motors electric motors are being used to power the conveyor belts and chain drives. All the motor starters were furnished by Westinghouse Electric; the belt feeders and chain-and-sprocket drives by Diamond Chain Co.; the screw take-ups and bearings by Link-Belt; and the dust suppressors by Johnson-March Corp.

Pumps supply water

Channel Constructors installed two Fairbanks-Morse pumps to supply water to the aggregate plant. A 30-inch-diameter line supplies the pump water to four Fairbanks-Morse booster pumps and the elevated constant-pressure water tank. Valves between pump connections make it possible for the four booster pumps to charge an 18-inch-diameter line that supplies water to the screens of the aggregate shipping bins, as well as to the screens of the entire plant.

The elevated water tank is kept full by an 18-inch-diameter riser off the 30-inch pump line. Constant water

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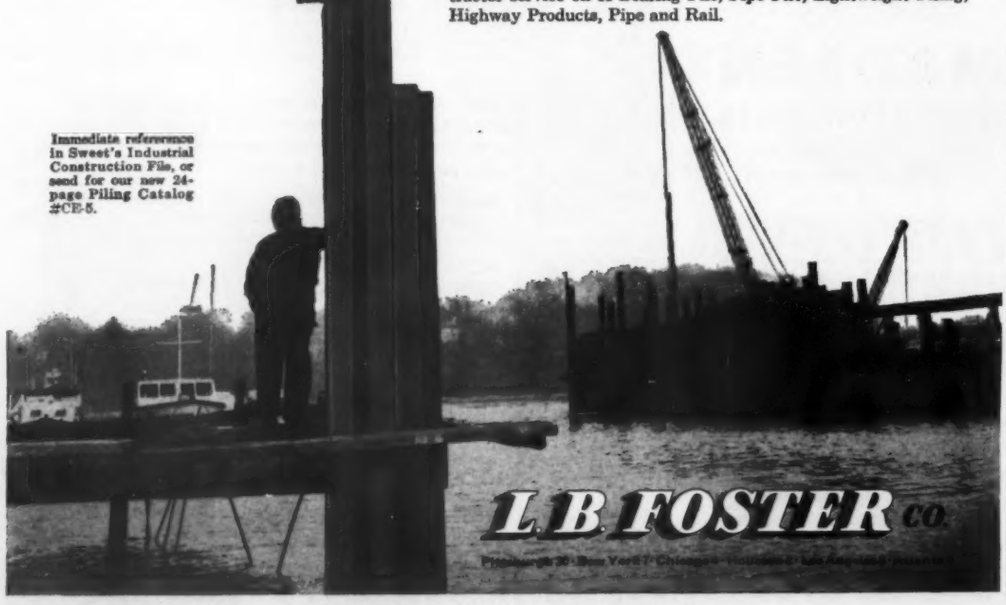
Immediate reference in Sweet's Industrial Construction File, or send for our new 24-page Piling Catalog #CE-5.



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pressure is maintained in the tank by having an 18-inch-diameter overflow line built into the tank. By means of a T-connection, the 30-inch line supplies water at a constant pressure (because of the tank's overflow setup) to a 16-inch line. This line, in turn, supplies water to the rod mills, scalpers, and screw classifiers at the sand preparation building.

Used water leaving the sand plant and the shipping bins is deposited in sumps at each of these locations. Two Allis-Chalmers sump pumps remove the water at each sump, through a pair of 12-inch-diameter tailings lines. The four tailings lines—two from the sand plant and two from the shipping bins—transfer the sump water to a 1,100×800-foot 3-compartment settling basin. Two compartments take up one-half of the settling basin area and are used to receive the sump water from the four tailings lines. Settlement of suspended fines is obtained in these two compartments; the overflow passes through sluice gates into the third compartment. The two Fairbanks-Morse pumps then pump water out of the third compartment and into the 30-inch water line supplying the plant.

THE END

Lengths of 8-foot-high reclaiming tunnel, fabricated of Commercial Shearing liner plates, await installation on the concrete tunnel floor. Bottoms of the sections will be set into grooves in the floor. Three tunnel rows, each over 1,000 feet long, run under the five main stockpiles and house 36-inch conveyors to feed the shipping bins.

A new Manitowoc 4500 crane, powered by a Cat diesel, moves into position to excavate the pipeline trenches for the plant. One of the big jobs for the rig is excavating the 3,000-foot-long open channel connecting the generating plant and the intake of the Niagara power plant.

HRB report analyzes purpose of highway law

"Legislative Purpose in Highway Law," Highway Research Board Special Report 39, is available from the HRB, 2101 Constitution Ave., Washington 25, D. C.

The list of chapters includes general problems of statutory construction; declarations of legislative purpose in general; use of declarations of policy in highway legislation; existing declarations of legislative purpose relating to highways; and a summary of findings and conclusions. Topics discussed are: opening new roads; highway funds; acquisition of land for highway purposes; construction and maintenance; federal aid; expressways; bridges, ferries, and tunnels; and toll roads.

Three appendices—a summary of statutes and selected cases, by state; statutes cited; and cases cited—conclude the report. The $4 bulletin is available from HRB headquarters.

Plastic center line tried on New York City roads

A plastic center line, Permaline, is being tested on New York City's Franklin D. Roosevelt Drive, the Triborough Bridge, and on school crosswalks in Manhattan and Queens. Purpose of the test is to see if Permaline will last longer than paint, which wears off quickly.

Veon Chemical Corp., Long Island City, N. Y., has guaranteed the material to last for three years. The manufacturer has worked glass beads into the plastic in order to increase reflection.

It provides 80 per cent visibility under poor weather conditions, as compared with 60 per cent for paint.

The plastic lines are used mainly on asphalt roads. But they will be tried on concrete highways although installation is more difficult on concrete.

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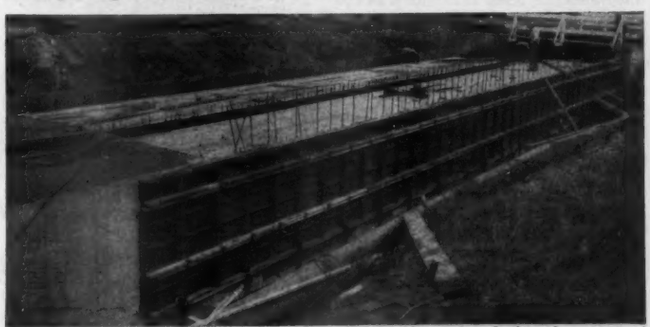
Gang Forming . . . Symons wide panel forms made up in sections of 10' x 24' and 15' x 24' used to pour 2,400 foot long retaining wall.

Bridge Forming . . . By using Symons high strength forms, contractor was able to reduce pouring time, use fewer men and cut 100 days off bridge forming job.



Culvert Forming . . . A new 9 x 9 inch steel haunch section designed to connect Symons standard wall panels and slab panels for the monolithic pouring of culverts.

Symons can help you with your forming problems. Our engineers will prepare complete form layouts and bill of materials at no obligation. Other Symons products used in road building are bar ties, tie chairs, column clamps and shores. Forms, shores and column clamps may be rented with purchase option—rentals to apply on purchase price. Information on Symons products and services sent FREE on request.

Symons CLAMP AND MFG. CO.

4251 Diversey Avenue • Dept. E9 • Chicago 39, Illinois

For more facts, use Request Card at page 18 and circle No. 221

Assembly-line precasting speeds construction of Mississippi River model

Work on a concrete unit of the Mississippi River model, for the Jackson, Miss., Sub-Office of the Corps of Engineers Waterways Experiment Station, is done inside a former barracks building. Platforms supporting individual blocks roll, assembly-line fashion, from one crew to the next.

How would you like to take the Mississippi River and cast it in concrete? The job sounds impossible, but it is currently being done by the U. S. Army Corps of Engineers.

Each year they place another 100 miles or so of the river as they work to complete the largest small-scale working model in the world.

The model of the Mississippi River, which includes the major tributaries, represents an area one-third the size of the United States. On the ground, it takes up some 200 acres.

The model is no toy. Flowing controlled amounts of water, the model can actually duplicate flood conditions in any particular river basin. By observing the results of the flow in miniature, the Corps of Engineers can predict the flood crest at downstream cities. With this knowledge, they can tell residents what to expect, and they, in turn, can more effectively fight the flood.

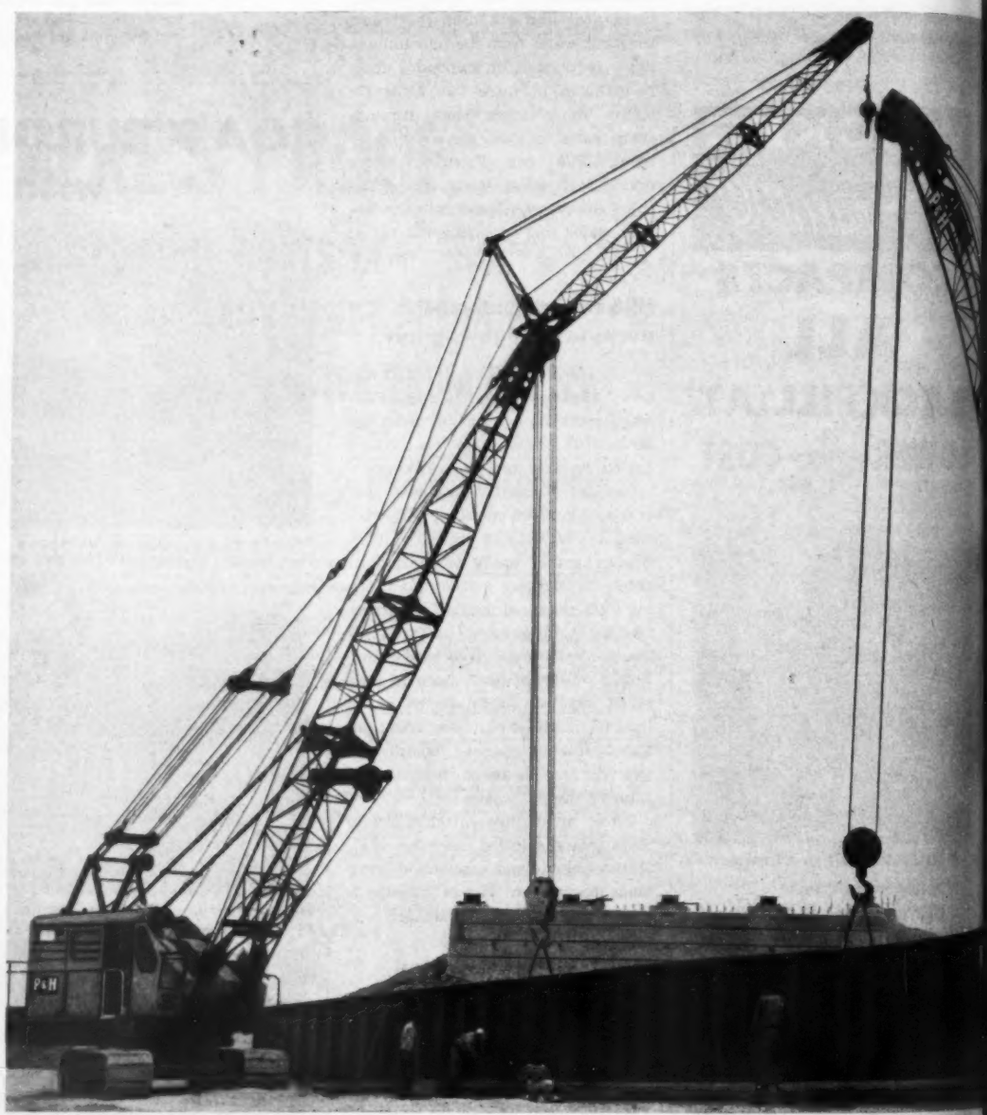
Using the model, engineers can tell the best way to regulate the many reservoirs and flood-control structures in the Mississippi River Basin in times of normal flow. This gives industry, shipping, and the people living in the area the maximum benefit of the available water.

The river-building job is located near Jackson, Miss. It is known as the Jackson Sub-Office of the Waterways Experiment Station.

Early methods of construction

Construction of the model started in 1943 and is a continual challenge to the Corps. Molding of the contours of the river channels and adjacent land in concrete must be done within very close tolerances. The position of the slabs of the finished model must stay exactly in place, unaffected by frost and ground movement.

As the model has grown with the years, the methods of forming and placing the concrete have become more efficient and more accurate. In the early years, concrete for the contoured slabs was placed on the natural ground. With all of the work being performed outside, the operation was subject to the weather. Although there is very little frost in Mississippi, the slabs resting on the ground did not hold their position



One P&H always sells another because those

P&H "PROFIT·LIFTS" place steel faster... safer... easier

Doing jobs profitably boils down to the effectiveness of men and machines. P&H machines like these 50-ton P&H 855B-LC crawler cranes can be depended upon to provide those profit-lifts that make it possible to bid low, win the job and make a profit.

Load lifting and placement at a profit are characteristic of P&H crawler cranes. There are plenty of reasons for it and they are all performance. It's the result of P&H planetary boom hoist that gives positive, infinite control over boom lowering; it's the P&H live roller circle that distributes the weight of the upper and the load evenly; it's MAGNETORQUE®, the frictionless, electromagnetic swing units that eliminate swing lining—result in faster work cycles.

in a very satisfactory manner.

Work out of weather

In 1952, the Corps developed a precasting technique that took the work out of the weather and put it on a fast assembly-line basis. The individual blocks, roughly 10×15 feet, are precast inside a building and later placed in position on the outside model. These blocks hold their position, for they are supported by poured-in-place concrete piles.

The concrete of the model does not blanket the entire area. Rather, it follows the general course of the river, spreading out on either side to a scale elevation of 30 feet above the highest flood of record. The vertical scale is 1 to 100, while the horizontal is 1 to 2,000.

Start with contour map

The model makers start with a contour map and end up with a block of concrete that duplicates very closely the shape of the river channel and adjacent land.

They first project the map to the desired scale onto a large tracing board. Contour lines are traced at 5-foot, and in some places, 2-foot intervals. Levees, highways, and railroads are located.

From this master map, 3-foot-wide strips are printed. At the precasting building, these strips are carefully oriented to form the map of the block.

Steel bands form contour lines

The irregular surface of the block is formed by raising the contour lines up off the map to their scale elevation. This is done by bending steel bands to fit the contour lines. The bands are then braised to the tops of dowels that have been driven into the plywood base of the form. The height of the steel dowels represents the elevation of the contour line. The plywood sides of the form are cut to fit the cross section of the ground.

The block is given additional strength by a light network of ⅜-inch rebars. From 4 to 7 adjusting bolts are also set in position in the form. These bolts, which support the block in its final position, bear on the capped pile top. They make it possible for the height of the block to be accurately adjusted. Before the concrete is placed, sand is placed on the bottom of the form so that a fairly even thickness (6 to 8 inches) of concrete results. Without the sand, the concrete would be unnecessarily thick under hills and high points of land.

Lightweight aggregate used

A Haydite lightweight aggregate is used in the concrete to reduce the weight of the block. The mix is vibrated as it is placed in the forms. When the concrete is sufficiently stiff, a mixture of sand and cement is placed on the top inch of the surface. This is more workable and permits crews to obtain a smoother finish. Under the watchful eyes of inspectors, workmen trowel the surface of the concrete to meet the top edge of the steel contour bands.

Wire bands, fitted to the contour lines of a map pinned to a plywood base, are braised to the tops of steel pins to form a three-dimensional contour line. The steel bands are checked closely for elevation, for they control the finished surface of the concrete.

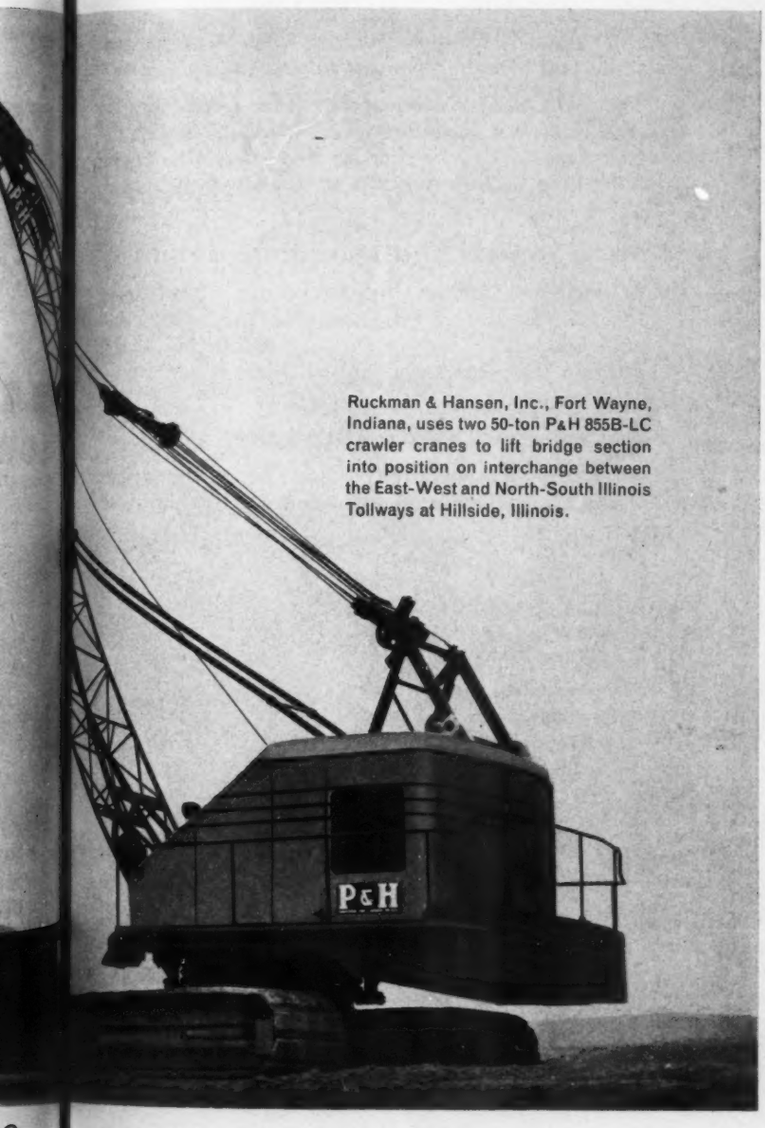
On the sides of the river channels, small brass inserts are placed at a predetermined spacing. These later receive little brass stems, which act to slow down the flow of water in the completed model. The extra roughness is needed to duplicate the flow of the actual river.

The blocks are sprayed with a curing compound and allowed to cure for 7 days before being moved to the model area.

A block a day

In the precasting building, assembly-line techniques speed forming and

(Continued on page 32)



Ruckman & Hansen, Inc., Fort Wayne, Indiana, uses two 50-ton P&H 855B-LC crawler cranes to lift bridge section into position on interchange between the East-West and North-South Illinois Tollways at Hillside, Illinois.

And, when the going gets extra rough, it's that bonus capacity that comes from the conservative P&H ratings and extra reserve power, strength and stability.

This is what produces those P&H "Profit-Lifts." It's the reason why P&H owners have grown 40% in the last 4 years.

With P&H, you get some of tomorrow's work done today. That's why leading contractors say, "... it's no wonder one P&H sells another."

P&H EXCAVATORS
½ · ¾ · 1 · 1½ · 1¾ · 2½ · 3 · 3½ yards
and CRANES
10 · 12½ · 15 · 20 · 25 · 30 · 35 · 40 · 50 · 70-ton

HARNISCHFEGER CORPORATION
Construction & Mining Division
Milwaukee 46, Wisconsin

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CONSTRUCTION EQUIPMENT CORP. Long Island City 1, New York
RALPH C. HERMAN COMPANY Marlboro, New York
P-D SERVICE, INC. Pavilion, N. Y.
CREDLE EQUIP. POTSDAM CORP. Potsdam, New York
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REYNOLDS COMPANY Nashville, Tennessee
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CENTRAL TEXAS EQUIPMENT CO. Austin, Texas
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HONOLULU IRON WORKS CO. Honolulu, T.H.

←For more facts, circle No. 222

BIG·NEW

Exclusive "Balanced-Design"

This new H-120 "PAYLOADER" tractor-shovel is the result of years of development by The Frank G. Hough Co., combining the experience and "know-how" of the pioneer and leader in this field. HOUGH "balanced-design" provides proper weight distribution; ample power for both drive and hydraulic operations and maximum reach and dumping heights consistent with the handling of bigger, heavier loads.

Safety and Stability Emphasized

The new boom arm design and positioning insures complete operator safety since all moving parts and pivot points are located forward of the operator's compartment. The stability of this new H-120 "PAYLOADER" is helped by the use of special high strength, light weight "T-1" alloy steel in the boom arms. Capacity loads can be carried close to the machine with a 40° bucket tipback at ground level and a flat 75° position at average carry height.

Ease of Operation

With power steering, power air brakes and power-shift transmission, this big tractor-shovel operates easier than many smaller units.

The operator compartment features a canopy, front and rear windshields and windshield wiper. The bucket-type seat is positioned to give unlimited visibility of the load at all stages of operation.

Sensible Service Accessibility

Easily removed panels expose electrical connections and batteries on one side — give access to hydraulic system controls and reservoir on the other. Daily or periodic checking and servicing points are easy to reach.

Two-Stage, Dry-Type Air Cleaner

An important engine protective feature of the new H-120 is the Donaldson "Donaclone" two-stage, cyclonic precleaner and filter air cleaner. It keeps out 99.8% of the dirt — maintains high efficiency regardless of engine speed, temperature changes or dust accumulation, requires 75% less service time.

Power and Efficiency

The H-120 is powered by a CUMMINS NRT-6BI turbo-charged diesel engine developing 300 H.P. at 2,100 rpm. It handles full load of both torque-converter and hydraulic pumps without "lugging down".

The power-shift transmission has four speed ranges in both directions including travel speed up to 28 mph. Exclusive dual brake controls give driver the choice of braking with or without transmission engaged.

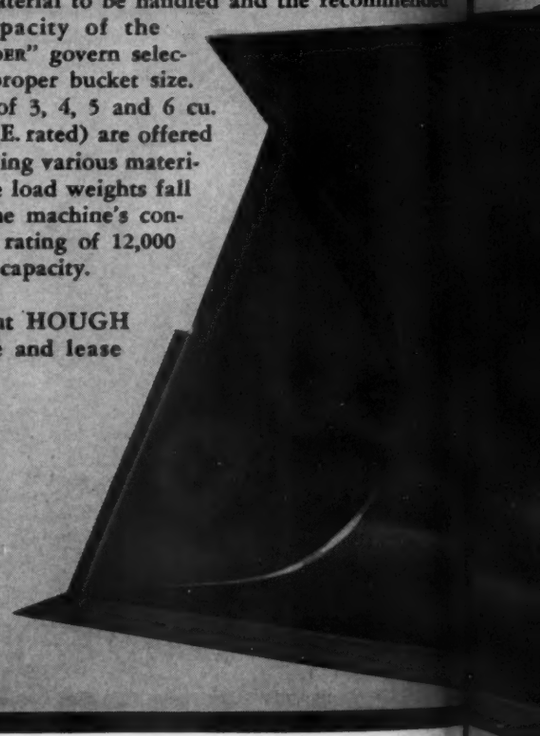
More Reach and Dumping Height

At maximum dumping height this new "PAYLOADER" has 14'6" clearance to the hinge pin and 10'10" clearance with the bucket dumped at 50° angle. In this position the reach from the front tires is 42".

Bucket and Carry Capacity

For continuous operation without abuse, the weight of the material to be handled and the recommended carry capacity of the "PAYLOADER" govern selection of proper bucket size. Buckets of 3, 4, 5 and 6 cu. yds. (S.A.E. rated) are offered for handling various materials where load weights fall within the machine's conservative rating of 12,000 lb. carry capacity.

Ask about HOUGH purchase and lease plans.



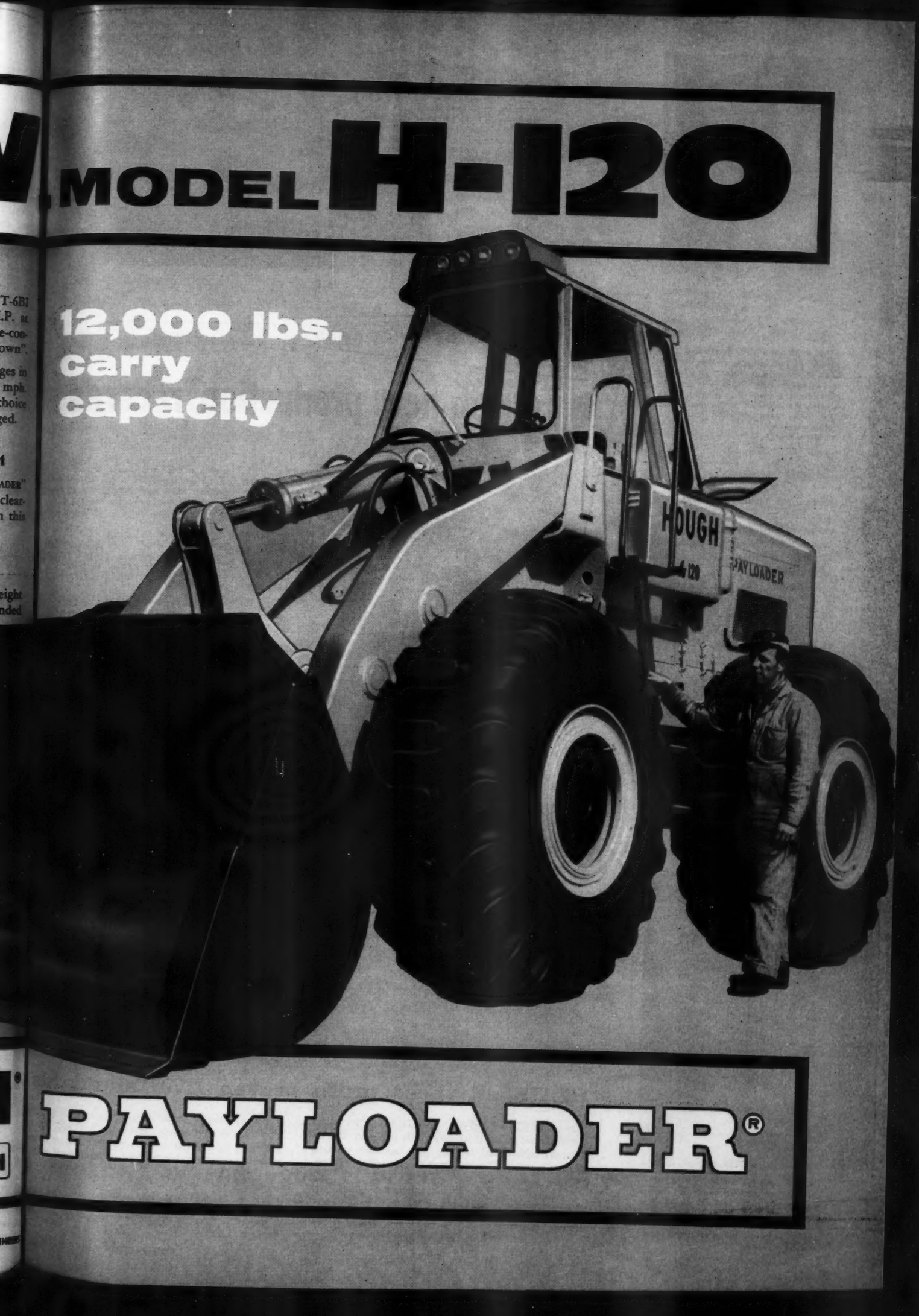
THE FRANK G. HOUGH CO. 5-8-1
762 Sunnyside Ave., Libertyville, Ill.
Send complete data on the big new model H-120.

Name
Title
Company
Street
City State

HOUGH

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

For more facts, use coupon or Request Card at page 18 and circle No. 223


MODEL H-120
12,000 lbs.
carry
capacity
HOUGH
H-120
PAYLOADER
PAYLOADER®

After reinforcing steel is set and sand placed in the bottom of the form to keep concrete to a uniform depth of 6 to 8 inches for hilly and low-lying areas, concrete is placed. A workman is vibrating the mix with a Master vibrator. Steel pipes keep adjusting bolts from being encased.

(*Continued from page 29*)

concrete placing for the blocks. The blocks, resting on wooden platforms, are pulled forward on rollers as the construction progresses. By using this technique, the model makers can turn out a block a day.

Completed blocks, resembling pieces of a giant jigsaw puzzle, are positioned with extreme care by a crane. Control points on the blocks are set by instrument within a sixty-fourth of an inch.

Piping is complex

As important as the concrete modeling is the installation of the complex piping system that moves the fresh water to and from the various rivers in the model. As of last year, some 22,000 feet of 4 to 14-inch pipe had been laid.

The water is fed to the model by a recirculating system consisting of a large sump, two 2,500-gpm pumps, a

The inspector looks over a slab that is curing. A mixture of sand and cement was applied to the top inch of the block to improve workability and ensure a smooth hand finish. The slab will stand for 7 days before being set in the model area by a crane.

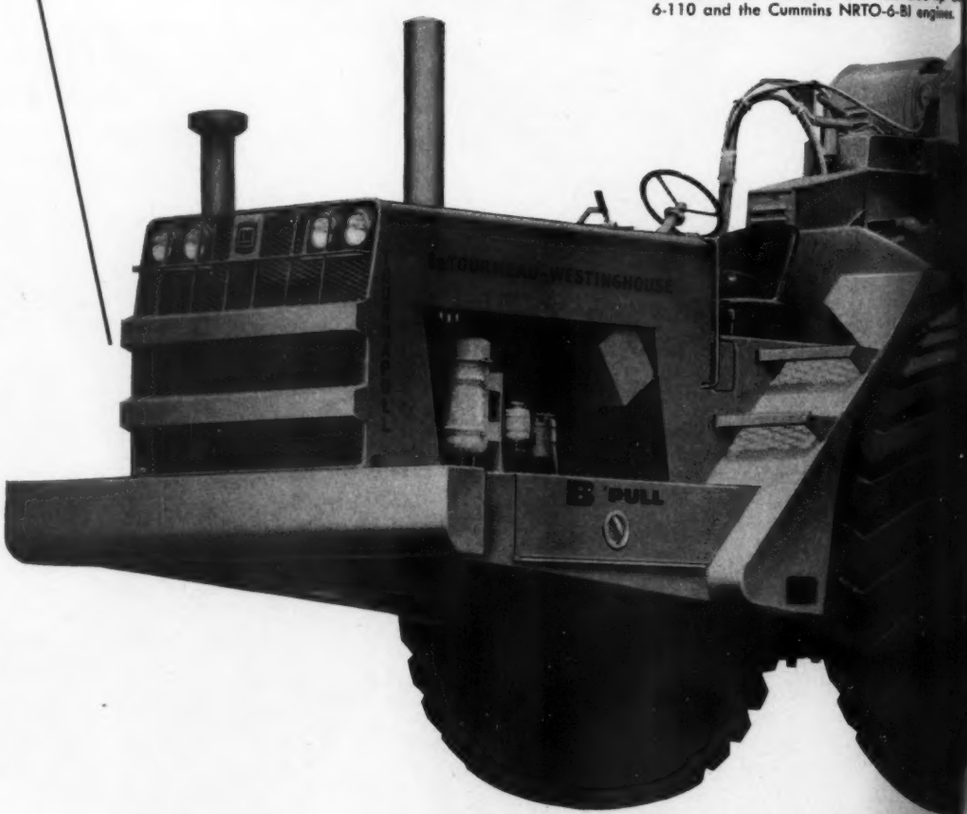
T. A. Leggett, superintendent of construction and maintenance, has the job of seeing to it that the pieces in the giant jigsaw puzzle fit within .005 foot. The water pipe from an outlet in the partially completed model carries water to a sump so that it can be recirculated through the model.

LW PARADE OF PROGRESS

To set new production records . . .

More Power

With a 360 *horsepower turbocharged engi* . . . the GM 6-110T . . . for ample power matter what the loading conditions, grades, traction. Also available are the 335-hp C 6-110 and the Cummins NRTO-6-BI engines.



PLUS all these profit-proven LW "standards"

Fast-loading 28-yd *Fullpak®* scraper design, for better "boil", fewer voids, more pay-yards per load; *Power-Transfer differential*, to keep your machines working in softest going; *Electric controls*, fast-acting, easiest-to-operate, easiest of all control systems to maintain; Positive-powered *kingpin-steer*, for fast, easy maneuvering in tight quarters; *Interchangeability*, of scraper with Rear-Dumps, for top use of equipment dollars.

. Jones, control-house operator, ob-
es the recording of the flow at one
e intake stations. Supply, measure-
t, and flow of water at various
ts in the model are handled from
control house.

50,000-gallon elevated tank, and supply and return lines.

Model checked against real floods

A metered amount of water from the supply lines is fed to the model at various inflow points. These normally coincide with a place where a stream enters the main river. The location of measuring points on the model generally corresponds with measuring stations on the river.

From the measuring stations on the real river, the engineers have complete records of actual flows at various times of the year, and records of the stages of previous floods. Knowing what actually happens to the river at these points, the engineers can supply water to the model to duplicate the stages of a previous flood.

Remotely controlled instruments measure and record the stages of the model river at various stations. In order to make sure that the model river actually duplicates the flows in the real river, five previous floods are run through the model. The water levels on the model must correspond with the records of the actual stages of the flood.

The supply, measurement, and record of the flow of water at the various points on the model are all handled from a central control house. Loaded with automatic instruments, the control house makes it possible for only a few men to control the operation of the model.

Personnel

H. C. McGee is chief of the Mississippi Basin Model. J. E. Foster is operation engineer, and T. A. Leggett is superintendent of construction and maintenance. THE END

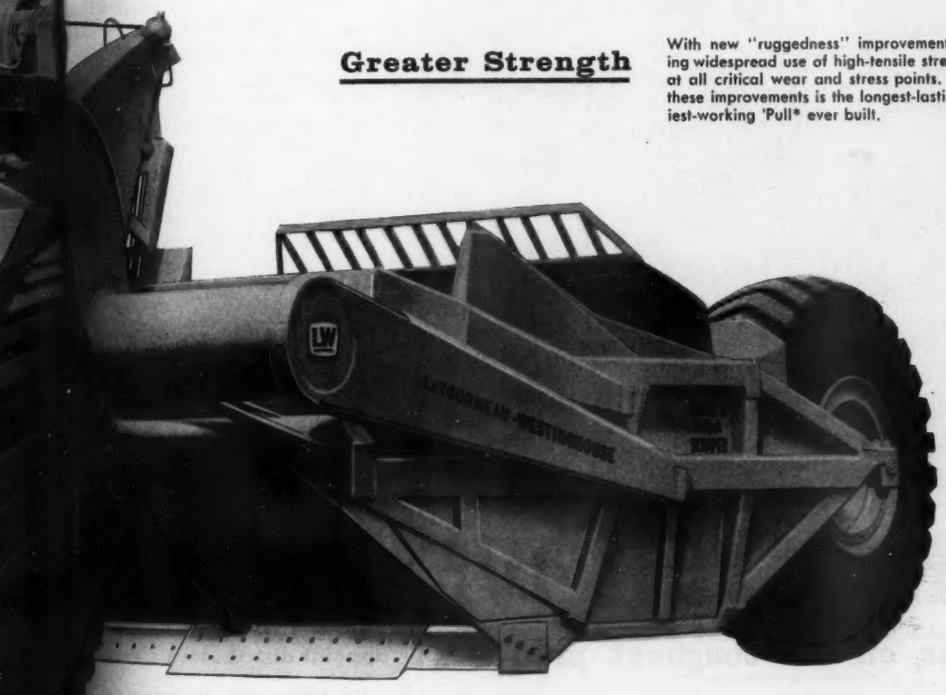
. . he New B Tournapull® now offers you

A New Transmission

Pressure-lubricated Fuller L-1550, developed especially for the 360-hp "B". A heavy-duty transmission with power-shift range box providing 10 forward speeds (to 30.2 mph), and 2 reverse. For torque-converter action, choose the "B" with Allison Torqmatic transmission. 335-hp "B" available with either Allison Torqmatic or L-1520 step-gear transmission.

Greater Strength

With new "ruggedness" improvements, including widespread use of high-tensile strength steel at all critical wear and stress points. Result of these improvements is the longest-lasting, steadiest-working 'Pull* ever built.



Watch LW in '59!

This announcement of the new B Tournapull follows, by only a few weeks, the unveiling of the new LW line of "full-sweep visibility" motor graders. Both developments are part of the LeTourneau-Westinghouse Parade of Progress . . . a program of design, engineering, and manufacturing know-how that is giving you the biggest-producing, lowest-cost-to-operate earth-moving machines in history.

Join the parade! . . . Ask your LW Distributor for full details. Tell him you'd like to see a demonstration.

*Trademark BP-2133-DC-2

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

For more facts, use Request Card at page 18 and circle No. 224

Goodrich ships 6 miles of rubber conveyor belt

Nearly six miles of rubber conveyor belting, the largest single belt shipment ever made by the B. F. Goodrich Industrial Products Co., Akron, Ohio, will be used on one of the world's longest permanent overland-transport belt-conveyor systems. The belting will be installed at the Ideal Cement Co. plant at Ada, Okla., to convey raw material for its recently expanded manufacturing facilities.

The 24 giant rolls of belting, standing nearly 10 feet high and having an over-all weight of 320,000 pounds, filled four freight cars. However, this is only a partial shipment by the company, a division of The B. F. Goodrich Co., on an order for 11 miles of belting for the 5½-mile conveyor system.

One section of the conveyor system, nearly 12,000 feet long, requires a single rubber belt more than 4½ miles long. This belt is so long that any given point on it will make only 10 round trips in an 8-hour day, even though the belt is constantly moving at 500 fpm.

Highway engineers elect

Walter Johnson, state highway engineer for Kansas, has been elected president of the Mississippi Valley Conference of State Highway Departments. Previous to his election, Johnson served out the unexpired term of George J. Thormyer as secretary-treasurer.

Dubin opens branch office

A branch office has been opened at 1357 Ponce de Leon Ave., Santurce, Puerto Rico, by the consulting engineering firm of Fred S. Dubin Associates, Hartford, Conn. This new office is under the direction of Victor M. Garcia, P.E.

Distributor doings

Manufacturer-dealer check list for contracts

by HAROLD M. DOOLEN

The following is a suggested check list of points to be considered by both manufacturer and distributor when preparing or accepting a distributor-manufacturer's contract. These suggestions are not to be construed in any way as a requirement to be imposed on manufacturers or distributors, but are a general guide for an intelligent approach in evaluating the adequacy of contracts to serve the mutual interest of both.

1. Territory to be worked by a distributor on either an exclusive or nonexclusive basis and with exceptions "spelled out."
2. Reservation of rights, if any, including federal or state governmental sales.
3. Responsibility of distributor and manufacturer to furnish each other with current financial information on their respective business.
4. Distributor's correct use of any manufacturer's trade-mark.
5. Provisions for changes in terms of contract.
6. Length of contract and provisions for renewal.
7. Restrictions in regard to reassignment of contract by either party.
8. Stocking requirements, if any, including both machines and parts.
9. Manufacturer's responsibility in accepting orders and responsibility for making deliveries after receipt of order from distributor.
10. Facility requirements of distributor as to both field service and shop service.
11. Commitment on part of distributor to conscientiously service the territory assigned.
12. Requirements of distributor, if any, to periodically furnish manufacturer with inventory of all machines and parts in his stock.
13. Requirements of distributor for proper displaying and storage of machines and parts.
14. Distributor's responsibility to pay taxes on equipment purchased for stock or resale.
15. Responsibility of all parties for insurance coverage on equipment, parts, and supplies.
16. Necessary arrangements to be made prior to return of machines or parts to manufacturer by distributor for credit.
17. Obsolete and slow-moving parts policy, if any.
18. Arrangements, if any, for division of discounts or commissions between distributors when more than one territory is involved in a sale.
19. Dealer discounts or commissions and terms of payment for both machines and parts.
20. Sales aids and advertising to be furnished by manufacturers, and distributors' responsibilities in their use.
21. Responsibility of distributor to furnish manufacturer with information as to sales made and prospects for future sales.
22. Full description of manufacturer's warranty and responsibilities of both manufacturer and distributor in administering same.
23. Restrictions on authority of distributor to make guarantees or commitments without manufacturer's consent.
24. Proper handling of claims of damaged goods.
25. When appointment is effected, arrangements, if any, to transfer stock from former distributor and for disposition of unexpired warranties in the territory.
26. How termination is to be effected. Arrangements, if any, for transfer of stock or return of same to manufacturer and for disposition of unexpired warranties.

THE END

Mr. Doolen is president of Western Construction Equipment Co., Billings, Mont., and immediate past chairman of the Manufacturers Relations Committee of the Associated Equipment Distributors.

JOB RECORDS PROVE

Firestones meet schedules on the toughest projects!

Where it's rough going for every yard moved, Firestone tires turn downtime into worktime profit! That's because every Firestone off-the-highway tire is job engineered for the toughest duty. They're built with Firestone Rubber-X, the longest wearing rubber ever used in Firestone tires! Firestone S/F (Shock-Fortified) nylon or rayon bodies shrug off bruising shock and impact. Tough Firestone treads and sidewalls work through terrain that often ruins ordinary tires. Call your Firestone Dealer or Store and ask about the full line of Firestone tubeless or tubed off-the-highway tires. He'll recommend the tires that are built for your job! And remember, Firestone off-the-highway tires are backed with on-the-job service!

Rock Grip Excavator® Wide Base Rock Grip Excavator®

When ordering new equipment always specify Firestone tires—available tubeless or tubed

Firestone

BETTER RUBBER FROM START TO FINISH

Enjoy the Voice of Firestone on ABC television every Monday evening.
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For more facts, use Request Card at page 18 and circle No. 225

Yale & Towne divisions appoint distributors

The Construction Equipment Co., Ltd., 6373 Cote De Liesse Road, Montreal, Que., Canada, has been appointed a distributor for the Trojan Division, Yale & Towne Mfg. Co., Batavia, N. Y. The dealer will handle the Trojan tractor-shovel line through its offices in the provinces of Quebec, Nova Scotia, Manitoba, Saskatchewan, and Alberta.

Lift Truck Service Corp., with sales and service centers in Fresno, Modesto, and Stockton, Calif., has been named a franchised representative for Yale industrial lift trucks and tractor shovels, produced by the Yale Materials Handling Division, Philadelphia.

Machinery Center, Inc., 1201 S.

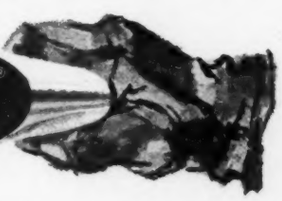
Ask the man who runs the job!

...no one makes a tougher tooth than ESCO

The right design, the right steel, the right shape make *ESCO* Points and Adapters right for every digging condition.

The construction industry looks to

ESCO®



Electric Steel Foundry Co., PORTLAND, OREGON

See reverse for shapes and size range

Here are the points to remember..

12M ALLOY STEEL

ESCO 12M Points are the toughest you can buy. Developed through years of research for the construction industry, cast *ESCO* 12M is carefully heat treated to produce the finest steel made for the severe shock and abrasion encountered by points and adapters.

RIGID QUALITY CONTROL TESTS ASSURE TOUGHNESS, HARDNESS

Every *ESCO* Point is Brinell tested to assure the exact degree of shock-absorbing toughness and abrasion-resisting hardness for longer digging life. Be sure to look for the Brinell mark on every *ESCO* Point you buy.

8 POINT SHAPES

You can select from eight different shapes to find the point that matches your digging conditions. *ESCO* Points are designed by bucket and excavation specialists who know how to achieve top digging performance. The self sharpening design of an *ESCO* Point makes it start sharp and stay sharp.

ESCO Points and Adapters for all digging equipment

Your local ESCO dealer can supply Points and Adapters for all your digging needs. By using ESCO Points and Adapters on all your equipment you can cut costs further by reducing your point inventory and consolidating purchases. Call your ESCO dealer today for details. He is listed in the yellow pages of your telephone directory. Or, write direct.

ESCO Point shapes start sharp, stay sharp and last longer under any digging condition.

ESCO

Electric Steel Foundry Company
2157 N.W. 25TH AVE. • PORTLAND 10, OREGON

MFG. PLANTS AT PORTLAND, ORE. AND DANVILLE, ILL.
Offices in Most Principal Cities
ESCO INTERNATIONAL, NEW YORK, N. Y. • IN CANADA

Sixth W., Salt Lake City, Utah, is now a franchised representative for Yale industrial lift trucks and tractor shovels in Utah, southern Idaho, and western Wyoming.

Five new United States dealers will now carry the Trojan tractor-shovel line. Tractor Supply Co., 4410 Kearney Mesa, San Diego, Calif., will cover Imperial and San Diego counties; George G. Anderson Co., 14800 Myrtle Ave., Harvey, Ill., serves the northern part of the state and Lake County, Ind.; H. C. Ormes Construction Equipment Co., 5600 Wayzata Blvd., Minneapolis, Minn., handles the entire state with the exeception of Duluth and its immediate area.

Equipment & Supplies, Inc., 540 Delmar Road, Pittsburgh, covers the western half of Pennsylvania; and Cactus Equipment Co., 8501 LaPorte Freeway, Houston, Texas, handles the Houston metropolitan area.

Warner & Swasey News

The Construction Equipment Division, The Warner & Swasey Co., Cleveland, has named three new distributors to handle its Hopto line in the United States and two Canadian dealers to carry both the Gradall and Hopto lines.

Dow & Co., Inc., 1820 Elmwood Ave., Buffalo, N. Y., covers 10 New York counties; Western Traction Co., 1615 Jerold Ave., San Francisco, with a branch in Sacramento, Calif., serves that state north of and bounded by the counties of San Luis Obispo, Kern, Mono, and Inyo. Brown-Bevis Industrial Equipment Co., 6650 E. Washington Blvd., Los Angeles, with branches in San Diego and Riverside, Calif., works the area south of Western Traction's territory, plus four Nevada counties.

LaHave Equipment Ltd., 14 Dufferin St., Bridgewater, N. S., Canada, covers Nova Scotia and Prince Edward Island; and New Brunswick from its Fredericton office. Construction Equipment Co. Ltd., 661 Wall St., Winnipeg, Manitoba, handles that province and three counties in the province of Ontario, as well as British Columbia, Alberta, and Saskatchewan.

Kliebenstein reorganizes

X. H. Kliebenstein Co., Ridgefield, N. J., has named J. K. Moran vice president and general manager. E. H. Kliebenstein continues to head the company. The firm is a distributor for Gradall, Hopto, Bros, Cleveland Trencher, M-R-S tractors and scrapers, Tanco bit pavers and International compactors.

E. F. Craven opens branch

A new office, warehouse, and shop has been opened on Sweeten Creek Road, Asheville, N. C., by the E. F. Craven Co., Greensboro, N. C. Manager of the new branch is Joe T. Rostic; shop supervisor, James T. Wallin; and office and parts manager, W. Strupe Lackey. The new branch will serve the western part of the state.

Rocky Marciano heads Bil-Jax distributorship

Rocky Marciano Enterprises — headed by Rocky Marciano, retired heavyweight champion of the world —has been named a Miami, Fla., distributor for Bil-Jax, Inc., Archbold, Ohio. The new dealer will handle Bil-Jax's line of tubular-steel scaffolding and allied equipment on Florida's east coast from Palm Beach south to the Keys.

(*Continued on next page*)

Rocky Marciano confers with Wilber M. Wyse, president of Bil-Jax, Inc., on his new distributorship.

This L-W POWER-Flow 660 grader earns more dirtmoving profit per dollar invested, because it gives you a double increase in work-output. Grader applies husky 190 horsepower thru torque converter . . . supplies *extra push-power with added speed* . . . cuts deeper, moves more dirt, pushes it faster.

P x Sp = WpD

let: P = push-power
Sp = work-speed
WpD = work per day

The amount of production dirt-work your grader can do in a day is largely dependent upon: (1) its push-power; and (2) the rate of speed at which it can handle each task. Stating this fact in the formula P x Sp = WpD, you'll note that any increase in either left-side factor — push-power *or* work-speed — gives you a *multiplied* increase in the resulting work-output.

A big L-W POWER-*Flow*® 660 Adams† grader gives you an increase in *BOTH* factors. It is the LeTourneau-Westinghouse torque-converter drive that gives you extra power and added speed . . . to boost production and increase the profits on your grader operation. In a day's time, "660" always puts-out more work . . . prepares more miles of grade and ditch . . . push-loads more scraper yardage . . . blades more dirt than other graders. Here's how:

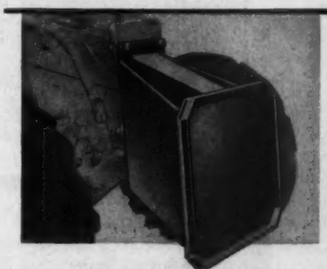
High-rpm push-power for all work

This big 190-hp L-W grader's torque converter and constant-mesh transmission deliver continuous high-rpm push-power *at all speeds*. Utilizing full engine-power, "660" can easily move big blade-loads, push-load scrapers, etc. As the initial starting load gets lighter, torque converter automatically brings grader up to *fastest possible pace for each particular blade-load*. Torque converter's fluid coupling also cushions the shock of load impacts . . . protects engine, transmission, final drive, and blade mechanism.

Cuts dead-head time

L-W POWER-*Flow* also completes more work because it wastes less time on travel . . . devotes a greater percentage of the work-day to production. It's the *fastest* grader made . . . travels job to job, or from one task to the next at up to 27.4 mph. In daily work-cycles, "660's" fast back-ups, alone, often save you an extra half-hour or more of productive time each day.

The torque converter eliminates stalling, and slipping-the-clutch to pick-up a heavy load . . . reduces number of time-consuming gear-ratio changes. And foot-operated forward-reverse power shift cuts waste-time on reversing of direction, and on all turn-arounds.



Push plate can make extra $$$'s for you

With this 36" x 30" push plate, your L-W Adams grader can double as a pusher on small jobs . . . or fill-in on big ones where short cycles or tractor "breakdown" idles your dirtmovers. It's handy also for push-starting balky equipment, to reduce delays that might cut your profit-per-yard. Plate can be attached either 30" or 37½" center-to-ground, to match your equipment. Available for 190, 160, 145, 123, 115, 80-hp L-W graders.

See for yourself how L-W Adams POWER-*Flow* 660 can give you extra production — more work per day — and help make bigger profits on your future work. *Ask us for a free demonstration.*

† Trademark G-1907-DC-1

LW

LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

For more facts, use Request Card at page 18 and circle No. 227

Koehring appoints dealers

Fincham Equipment Co., Inc., 1033 W. Mississippi Ave., Denver, Colo., has been named a distributor for the Koehring Division, Koehring Co., Milwaukee. The dealer will handle the complete line of Koehring products in Colorado and 11 southern Wyoming counties.

The parent company has appointed Fenwick Machinery, Inc., U. S. 46, Caldwell, N. J., as a distributor of Koehring, Parsons, Kwik-Mix, and Ka-Mo products. Twelve New Jersey counties will be covered by the dealer.

Clark names distributors

Bashaw Equipment Co., Fifth Ave. at Merrill Field, Anchorage, Alaska, has been appointed to sell and service Michigan tractor shovels, dozers, scrapers, loggers, and excavator-cranes made by the Construction Machinery Division, Clark Equipment Co., Benton Harbor, Mich. The dealer will cover the entire state.

C. A. Lippincott & Bro., Inc., Third and Union Sts., Moorestown, N. J., will handle the Michigan equipment line in nine counties of the state.

LW names distributor

Toole Corp., 6615 Corson Ave., Seattle, Wash., has been appointed a distributor for the complete line of earthmoving, hauling, and grading equipment manufactured by the LeTourneau-Westinghouse Co., Peoria, Ill. The dealer will sell and service the equipment in the western half of Washington.

Parker Seal appoints

Great Lakes Rubber & Supply, Inc., 3118 N. Teutonia Ave., Milwaukee, has been named a distributor of industrial Gask-O-Seals and Stat-O-Seals, for pipe flange connections and fasteners, manufactured by Parker Seal Co., division of Parker-Hannifin Corp., Culver City, Calif., and Cleveland, Ohio. Great Lakes Rubber & Supply has been a leading outlet for Parker synthetic rubber O-rings for several years.

Industrial Gasket & Packing Co., Inc., 1015 E. Third St., Tulsa, Okla., has been named to carry Parker synthetic rubber O-rings.

Detroit Diesel appoints two new distributors

Dixie Engine Co., Atlanta, Ga., has been appointed a diesel-engine distributor for the Detroit Diesel Engine Division, General Motors Corp., Detroit. With offices at 3809 Tuskegee Ave., S. W., the dealer will cover the western part of the state.

Bialock Machinery & Equipment Co., which has served as a GM Diesel distributor in Georgia for many years, continues to operate in this capacity in Atlanta and Albany, Ga.

Keystone Diesel Engine Co., Inc., U. S. Highway 19, Wexford, Pa., has been named a distributor of the complete diesel-engine line for western Pennsylvania.

Kwik-Mix department names two dealers

The Ka-Mo Department of Kwik-Mix Co., Division of Koehring Co., Port Washington, Wis., has appointed Contractors Machinery Co., 3311 Plainfield Ave., Grand Rapids, Mich., a distributor for the entire lower peninsula of Michigan. This dealer also maintains a branch office at 13300 North End Ave., Detroit.

Fornaciari Co., 5350 E. Washington Blvd., Los Angeles, will cover 7 southern California counties and Clark County in Nevada.

Both firms will handle Ka-Mo boring and drilling equipment.

Buffalo-Springfield names

Highway Equipment Co., 6465 Hamilton Ave., Pittsburgh, Pa., has been named to carry the entire line of equipment produced by the Buffalo-Springfield Co., division of Koehring Co., Springfield, Ohio. The dealer, which has a branch at 40 Hoover Ave., DuBois, Pa., will cover the Pittsburgh area.

Ohio dealer for B-E

Wheel & Track Equipment, Inc., 11536 Dayton Pike, Sharonville, Ohio, has been appointed an excavator distributor for Bucyrus-Erie Co., South Milwaukee, Wis. The distributor will cover 22 Ohio counties, five Indiana counties, and three Kentucky counties.

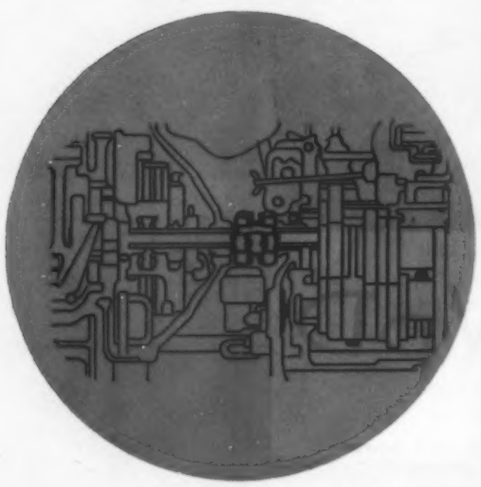
Customer, dealer schools held by Iowa Mfg. Co.

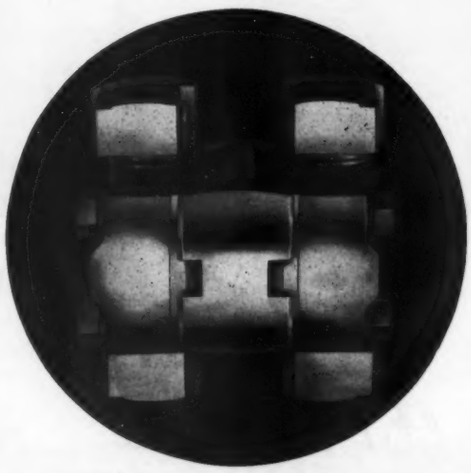
Three service schools were conducted recently by Iowa Mfg. Co., Cedar Rapids, Iowa. Customers and dealer representatives from both Canada and the United States attended. Classes were of the open-discussion type, with visual aids and equipment. Members of the company's Service Engineering Department conducted the 5-day school.

In addition to classroom sessions, guided plant tours were arranged.

If Limited Space Is Your Problem

Specify This Close-Coupled Joint





MECHANICS

Roller Bearing UNIVERSAL JOINTS

For Cars, Trucks, Tractors, Farm Implements, Road Machines, Industrial Equipment, Aircraft

If you are faced with the problem of locating a universal joint in a space where limited clearance does not permit the use of a flanged joint, MECHANICS close-coupled Roller Bearing UNIVERSAL JOINT is your solution. This joint is specially designed for operation within cramped quarters that engineers formerly considered too short to accommodate a universal joint. Let our engineers show you how MECHANICS close-coupled UNIVERSAL JOINTS will conserve space, compensate for offset shafts and provide ample angularity in your new, compact models.

BW

Export Sales: Borg-Warner International
79 E. Adams, Chicago 3, Illinois

MECHANICS UNIVERSAL JOINT DIVISION

Borg-Warner • 2030 Harrison Ave., Rockford, Ill.

For more facts, use Request Card at page 18 and circle No. 228

Armco Steelmobile tours engineering colleges

The Armco Steelmobile, a traveling exhibit developed by Armco Drainage & Metal Products, Inc., a subsidiary of Armco Steel Corp., Middletown, Ohio, is visiting engineering colleges in Ohio, West Virginia, Maryland, Pennsylvania, Delaware, New Jersey, and New York. The purpose of the tour is to acquaint engineering college students and faculty with the advantages of flexible metal drainage structures, foundation pipe piling, and steel buildings.

Richard A. Carr is accompanying the exhibit, giving lectures and showing movies to engineering classes and student organizations.

C. I. T. elects McMaster

Randolph J. McMaster has been elected an assistant vice president of C. I. T. Corp., New York City industrial financing firm, and head of its Portland (Ore.) division. He succeeds the late Carl H. Anderson.

The company has opened a division office in the H. A. Porter Bldg., 601 Grant St., Pittsburgh, Pa. John R. Luce, assistant vice president and division head, will supervise the firm's operations in western Pennsylvania and West Virginia. He will be assisted by Arthur Johnston.

Field representatives E. R. Petersen and J. M. Baysden will cover western Pennsylvania and West Virginia, respectively. Petersen will headquarter in the Pittsburgh office; Baysden, in Charleston, W. Va.

A three-state division headquarters has been opened by the firm in Rand Tower, Minneapolis. This division will have charge of C. I. T.'s operations in Minnesota, North Dakota, and South Dakota, with the exception of the 10 westernmost counties. Harvey L. Kyle, assistant vice president and division head, will be in charge of the office. He will be assisted by Paul H. Snavely, division operations head.

Old rail roadbed to be limited-access highway

The old roadbed of the defunct New York, Westchester & Boston Railway will be developed into a limited-access county highway in Westchester County, N. Y. The highway will use 1.2 mile of the old railway right-of-way, rock ballast, and bridges, from Old Mamaroneck Road at the White Plains-Scarsdale boundary to Weaver Street on the Scarsdale-New Rochelle boundary.

Since the transit line went into bankruptcy 20 years ago, most of the roadbed has been carved into lots for homes and stores, with small parts of the land redeveloped for some of the New England Thruway.

Seaway authority names

The St. Lawrence Seaway Authority has appointed A. M. Luce general superintendent of maintenance, under the supervision of R. J. Burnside, director of operations and maintenance.

TUBES ARE PLACED in a steam superheater for a butadiene plant addition in Port Neches, Texas by a Manitowoc 3900 with 140-foot boom and 30-foot jib. Seven Manitowoc cranes are in use on the $24 million project.

HOW YOU CAN:

- **speed-up fill compaction**
- **reduce equipment congestion**
- **handle scattered dozing at lowest cost**

With the big yardages hauled by today's larger capacity earthmovers, you stand to lose profits if you must delay hauling cycles to allow time for specified compaction. These delays may be caused by: 1) inefficient compaction tools; or, 2) too many slow-moving dozers, graders, and compaction units working in such a small area that they get in the way of your production units.

To solve this problem — and automatically reduce your equipment investment — you can replace slow-speed dozers and tow-tractors with fast, heavy-duty, rubber-tired LeTourneau-Westinghouse Tournatractor®. Here's how this multi-purpose 218-hp tractor can help you speed-up dozing and compaction . . . and *save you money.*

1. Works fast . . . compacts more fill per day — Powerful L-W rubber-tired tractor tows compactors weighing up to 50 tons. This — together with its high speed, maneuverability, easy handling, and ability to level fill with dozer blade while towing a compactor — makes it possible for Tournatractor to meet specified compaction requirements faster and in fewer passes.

2. Gives bonus compaction equal to extra 20-ton roller — With tires hydroflated, Tournatractor itself provides *bonus compaction equivalent to an extra 20-ton roller.* Rolling action of its broad, low-pressure tires confines and compacts soil under the tread — rather than displacing it. As a result, it helps obtain maximum compaction in less time.

MOBILE "JOB BALANCER"

When compaction work is completed, mobile L-W tractor is ideal for hit-and-run assignments. At a moment's notice, operator can unhitch towed tools and drive to cut area to balance pushers . . . or it can smooth haul roads, build shoulders, handle stockpiling, restore washouts, cut drainage ditches. Tournatractor will handle dozing or towing jobs anywhere on your project, to help complete your work faster . . . at bigger profit.

Let us give you the whole story. We'll be glad to demonstrate this powerful, 17-mph L-W Tournatractor. Ask for full details.

CT-1943-DC-1

Speedy, 218-hp Tournatractor levels and compacts fill in one operation . . . eliminates the need for many specialized tools that cause congestion on the fill. With tires hydroflated, L-W tractor alone provides compaction equivalent to an extra 20-ton roller . . . at a big saving in expense.

LW

LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

For more facts, use Request Card at page 18 and circle No. 229

International's new B-line of trucks makes its bow in Chicago's Ambassador West Hotel for the press. At left, the 1½-yard Model B-130 dump truck; in the background, the Model BCF-170 with tandem-axle chassis.

New truck line in the spotlight

The new line of International trucks came out in style early last month. Under the glittering chandeliers of a ballroom in the Ambassador West Hotel in Chicago, a selection of the new models was displayed to members of the press.

Designated the B-line, these new light, medium, and heavy-duty trucks offer advanced styling, a new pickup body design, and various engineering improvements. They range in weight from 4,200 to 33,000 pounds.

The vehicles are available in 4, 6, and all-wheel-drive chassis, with 6-cylinder or V-8 engines and a wide choice of conventional and compact-design models.

Of particular interest to contractors is the heavy-duty 6-wheel model BCF-174 with dump body. Rated up to 30,000 pounds gvw, this tandem-axle series is offered with a standard 6-cylinder engine or new optional 193-hp V-8 engine. Highlights of styling improvements are chrome-mounted dual headlights and new vinyl cab interiors. Wheelbases range from 137 to 185 inches. A wide range of transmission, axle, and other components is offered for maximum truck-to-job specialization.

Contractors will also be interested in the new B-line pickups. The vehicles feature an extra-wide body that provides 25 per cent additional capacity. The body is available in 7 and 8½-foot lengths, with capacities of 59 and 73 cubic feet, respectively. Tail-gate design affords convenient one-hand opening or locking, with a new center-type single-lever control. This eliminates the necessity for hooking and unhooking chains from each side of the body.

To power the B-line of trucks, International has put on the market three new V-8 engines. Designed specifically for truck service, the gasoline engines vary from 155 to 197 horsepower. Also available are nine 6-cylinder, valve-in-head engines with 113 to 154-hp ratings. THE END

P&H divisions appoint

The Construction and Mining Division of Harnischfeger Corp., Milwaukee, has appointed C. R. Morgan its Dallas district manager. The sales area of that district covers the entire state of Texas.

Hardwick L. Browne has been named sales manager of welding products for the International Division. Working out of the home office, Browne will have complete responsibility for the division's sale of P&H welding machines, welding electrodes, and welding positioners.

Keep our ROADS on the GO

Atlas White Cement marks the curve day or night

Reflecting concrete curbing made with Atlas White portland cement marks the road's course—every straightaway, curve and turn—well ahead of the driver. By day, the white surface stands out in contrast to darker road paving. By night, saw-toothed corrugations reflect the car's headlight beams back to the driver for greater visibility. And rainy weather actually heightens the effect; wet curb surfaces become even more reflective.

For more information on the use of Atlas White portland cements in highway and street construction, write Universal Atlas, 100 Park Ave., New York 17, N. Y.

OFFICES: Albany • Birmingham • Boston • Chicago Dayton • Kansas City • Milwaukee • Minneapolis New York • Philadelphia • Pittsburgh • St. Louis • Waco

CB-97 "USS" and "Atlas" are registered trademarks

USS Universal Atlas Cement Division of United States Steel

For more facts, use Request Card at page 18 and circle No. 230

Burns & Roe designs BMEWS building for RCA

A BMEWS (Ballistic Missile Early Warning System) model building will be built for the Radio Corp. of America at Moorestown, N. J. BMEWS is designed to detect any enemy ballistic missile shortly after it is launched, give continuous position and velocity readings, and predict its point of landing.

The New York City consulting engineering firm of Burns & Roe, Inc., designed the 36-foot-high test facility, which will have two full floors and half a mezzanine to house personnel and equipment. The 145-foot-square building will be heavily shielded against radio frequencies to protect instruments and personnel from the antenna's radiations.

A steel framework will support the prefabricated modular panels that make up the curtain-wall construction. The sandwich-panel curtain walls consist of an insulating material faced on both sides with sheet steel to permit welding adjacent sections.

Walls will be 1½ to 2 inches thick and will provide insulation equivalent to about 3 inches of mineral wool. Outside surfaces will be treated to resist the elements.

Atop the building, a nearly spherical 140-foot-diameter radome will rest on a 105-foot-diameter base. The radome is a framework of steel box members, irregularly shaped so as not to interfere with transmission or reception. Reinforced plastic sections are mounted in the frame to complete the radome.

The antenna tower, to be built independent of the rest of the building to avoid stresses that might cause shifting, will be erected on an 8-foot-thick octagonal slab measuring 55 feet across flats. Four outriggers, 10 feet wide, will prevent rotation due to the large inertia forces exerted by the heavy antenna. More than 800 cubic yards of concrete will be used in the mat and some 260 cubic yards in the tower itself.

Factory training school opened by Rust-Oleum

Rust-Oleum Corp., Evanston, Ill., has opened a factory training school for its industrial distributor salesmen. The new school is held the fourth week of each month at the Evanston plant. The 3-day course includes intensive training in product knowledge, application methods, and industrial selling techniques.

Portugal subsidiary founded by Atlas Copco

Atlas Copco de Portugal Ltda. of Lisbon has been established by Atlas Copco to supply compressors and air-powered tools for construction, mining, and general industrial work in Portugal. The new subsidiary will be directed by Bo Englund, former managing director of Atlas Copco companies in Turkey and Belgium.

The parent firm is headquartered in Stockholm, Sweden.

A BARGE PLATFORM carrying a 50-ton crawler crane sped steel erection for a single-track bridge for the Michigan Central Railroad over the Little Calumet River near Calumet City, Ill. On this platform, two falsework bents were built and the first four panels of the truss span assembled. The trusses were floated into place on the barges. The Chicago plant of Bethlehem Steel Co. fabricated 928 tons of structural steel for the project.

WHEN YOU'RE PUSHING EQUIPMENT TO SHOW A PROFIT

...THERE'S NO ROOM TO GAMBLE ON MAINTENANCE—

WIX Filter Cartridges are engineered specifically for every engine in construction service...gasoline or Diesel...mobile or stationary...for lube, fuel or air. There are WIX replacement Cartridges for:

CATERPILLAR • DETROIT DIESEL
INTERNATIONAL
LE TOURNEAU • MURPHY
ALLIS-CHALMERS
and ALL OTHER Construction Equipment

WRITE Get full particulars on WIX-PAX Service for Fleets and how you can get WIX Filter Survey and Fleet Manual FREE

particularly on oil and air filters! And, there's no *reason* to gamble! You can KNOW in an instant what WIX Cartridges you need for every piece of equipment in your spread and exactly how your stock of cartridges stands. How?

Simply by having a WIX factory expert survey your equipment and furnish you with a FREE Filter Survey at no obligation to you. Then with a balanced stock of top quality WIX Cartridges, you have real engine protection—Prescription Filtration—*just what the doctor ordered!* No gambling with engine wear . . . no gambling with down time. Get the facts today!

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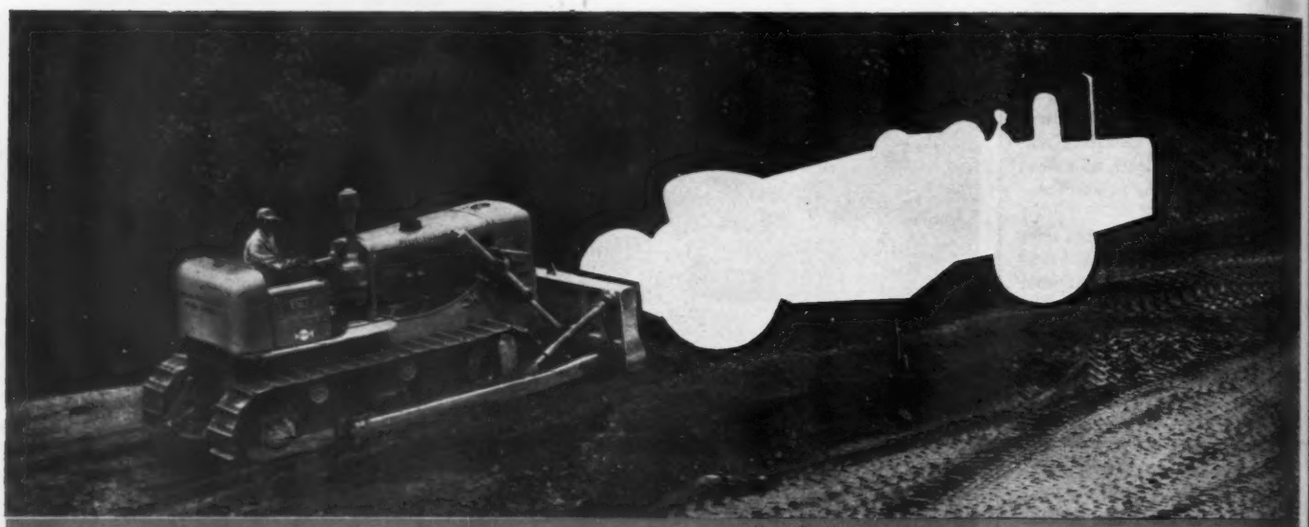
Please send us complete information on your FREE Survey and WIX Prescription Filtration.
Name_____
Company_____
Address_____
City_____ Zone____ State_____

For more facts, use coupon or Request Card at page 18 and circle No. 231

Same cut... same pusher
5% more dirt in 42% less time

DAY IN...DAY OUT, THIS ALLIS-CHALMERS 9½-YARD TS-160 OUTWORKS ITS LEADING COMPETITOR...AND DELIGHTS ITS OWNER*

This is no demonstration setup. It's a road job* where these two self-propelled scrapers worked every day . . . push-loaded by the same Allis-Chalmers HD-16 torque converter tractor. That made every loading cycle about as identical as they'll ever get. And hour after hour, the TS-160 moved out of the cut with a heaped load in an average of 42% less time than its 9-yard companion of another make. *This is extra work power you can turn into profit!*



Scraper X, heaped loads in 35 seconds, 9 yards heaped

TS-160, heaped loads in 20 seconds, 9½ yards heaped

* Further details on request

You may be surprised . . . may even challenge these facts. But facts they are, and we invite you to check them on *your* job, with *your* stop watch. Call your nearby Allis-Chalmers dealer now. He'll provide the TS-160 . . . when and where you say. *Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.*

move ahead with ALLIS-CHALMERS
...power for a growing world

For more facts, use Request Card at page 18 and circle No. 232

The first "candelabra" top on an East Coast television tower crowns this 730-foot structure on Television Hill in Baltimore. U. S. Steel "T-1" structural alloy steel, which can withstand 100,000 psi, was used in the tower legs to bear the weight of the candelabra and the three 10-ton antennas.

Maryland television tower features "candelabra" top

Baltimore's new three-channel television tower is the first on the East Coast to be built with a "candelabra" top. The spectacular crown is a triangular platform on top of three 625-foot steel legs.

Points of the platform are 100 feet apart. They support three 10-ton antennas, one for each of the city's television broadcasting stations. The 102-foot antennas, plus 24-inch lightning arrestors and airway beacons, bring the total height of the tower to 730 feet.

The base of the tower is a concrete hexagon, measuring 15 feet to a side and extending 20 feet into the ground. It is guyed by 12 sets of steel wire rope installed in pairs at four different levels. The guy ropes are anchored in poured concrete blocks 33 feet square and 16 feet deep.

U. S. Steel's "T-1" structural alloy steel, which can withstand pressures of 100,000 psi at either high or low temperatures, was used in the tower's main support members.

The $1,125,00 project was started two years ago. The tower is owned and used by stations WBAL-TV, WJZ-TV, and WMAR-TV. It is operated under the name of Television Tower, Inc., an organization of officials of the three stations it serves.

New York Port Authority elects Colt chairman

S. Sloan Colt has been elected chairman of the Port of New York Authority; Horace K. Corbin was elected vice chairman; and Howard S. Cullman was re-elected to his fourth term as honorary chairman.

Colt, who has been a commissioner for the past 13 years, succeeds Donald V. Lowe, who has been a commissioner for 14 years, vice chairman for 2 years, and a chairman for 4 years.

Corbin was appointed a commissioner 11 years ago. He succeeds Eugene F. Moran, who was first appointed to the authority 17 years ago and who has served as vice chairman for the past 4 years.

At the same time, Austin J. Tobin was re-elected executive director, a post he has held for the past 16 years. He has been with the bi-state agency's law department for 32 years.

Sidney Goldstein was re-elected general counsel. He has been a member of the authority's law department for 25 years.

Green highways with yellow centerlines proposed by optometrist for high safety factor

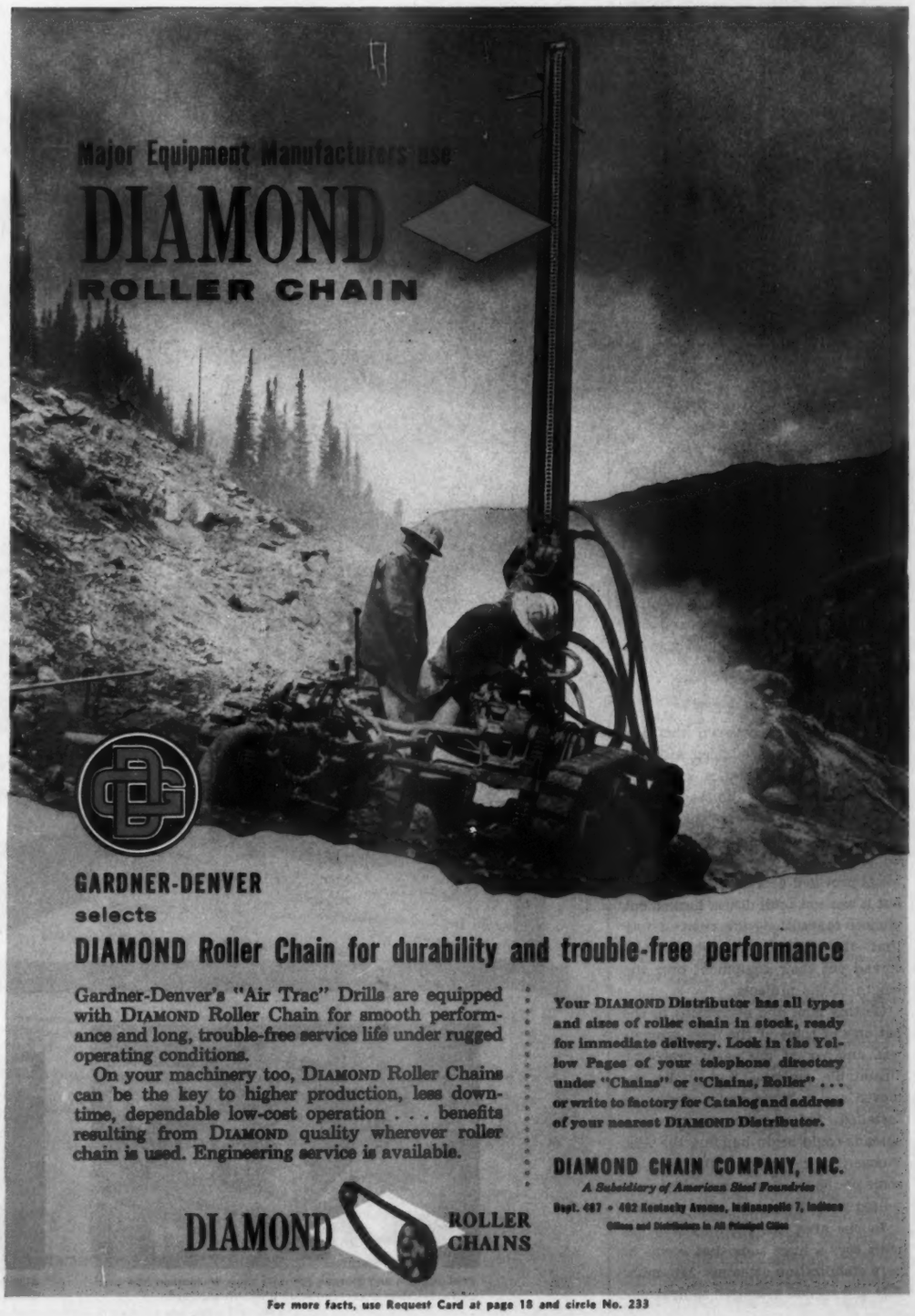
The nation's highways may one day be two-toned, green and yellow if Dr. Alden N. Haffner, executive director of the Optometric Center of New York, has his way. Addressing a symposium on "Vision of the Motorist as a Key Factor in Highway Safety", he declared that the present black or white surfaces caused glare.

He suggested that highways be green, and that the pigment be added to the asphalt or cement. The dividing line, he stated, could be a contrasting yellow. Dr. Haffner called these colors restful and less glaring to the eye. He declared that the very lack of color in black caused it to lead to fatiguing situations.

Dr. Haffner also suggested that New York State drivers be required to carry a driver's vision identification card. This card would show visual clarity for each eye, depth perception, glare recovery, visual fields, and color efficiency.

Among other things, the card would indicate whether a driver should wear glasses when driving. It would also note drivers who should be kept to a 35 mph limit, and those who should be kept from driving at night.

The symposium, held at the Barbizon Plaza Hotel in New York City, was attended by more than 105 optometrists, most of them from the Metropolitan New York area.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Slides, rock, deep canyons, lack of access make for

Rugged grading on coast highway

Three contractors have tackled some of the roughest terrain imaginable in grading a 16-mile section of U. S. 101, the Coast Highway, from Brookings, Ore., to a point two miles south of Pistol River in the southwest corner of the state. Four contracts totaling more than $8 million provide for the grading of a modern highway on a completely new alignment along the rugged coastal range overlooking the Pacific Ocean.

Two of the sections are being built by Peter Kiewit Sons' Co., Vancouver, Wash. The other two contractors are Morrison-Knudsen Co., Inc., Boise, Idaho, and Darkenwald & Harms, Sacramento, Calif. The latter is a joint venture of Darkenwald Construction Co., Inc., and Harms Bros., both of Sacramento. The project was planned and is being supervised by the Oregon State Highway Commission.

The new highway will have a 24-foot finished roadway flanked by 8-foot shoulders on both sides with added 10-foot passing lanes on all long upgrades. In contrast to the existing highway, which winds through the timbered mountains on an alignment that restricts speed to 30 mph or less, the new road hugs the coast line and is designed for speeds of 60 mph. It slashes through the ridges and over the valleys, shortening the distance by nearly 30 per cent.

Many job problems

The divergence between the new and old alignments, coupled with the almost complete absence of other roads, created one of the major problems for the contractors—that of access to a sufficient number of points on the right-of-way. A few logging roads provided access to some points, but it was not until dozers hacked out pioneer roads along the right-of-way that the contractors could really spread out their equipment over the length of the projects.

Getting men and equipment to the bottoms of some of the deep canyons was another of the early problems. Unsuitable material had to be removed and culverts and underdrains installed before the earthmoving spreads could begin building the fills. Pioneering the tops of the cuts on some of the steep mountainsides presented almost as much of a problem.

In one area, the highway is being built over a huge slide that seems to defy stabilization attempts. Minimum fills and special attention to drainage features help provide a stable roadbed in this tricky area.

Added to the many other complications is the heavy rainfall through the fall, winter, and spring which results in a short working season. The average working season for grading is about 120 days per year. Most of these contracts have 240 days allowed, with completion of the 16-mile section scheduled for this fall.

Drainage is big item

Kiewit took the contracts for the first and last sections of the work, getting started on the first section just north of Brookings early last summer. After pioneering an access road through the section, PKS turned immediately to the drainage items. These included five box culverts ranging from 4×4 to 8×8 feet in section and from 215 to 470 feet long. Also included in the drainage work was 2,190 feet of 12 to 48-inch culverts and more than 20,000 feet of 8, 8, and 12-inch perforated-metal underdrains.

A spread of six Cat DW21 scrapers with two D9 push-Cats moved right in on the long-haul dirt, while four D8's with Cat 80 scrapers worked some of the rougher spots and the shorter hauls. Six more D8's with dozers and rollers handled the spreading and compaction work on the embankments.

One big rock cut had to be drilled and shot. Here a D8 carrying an Ingersoll-Rand hydraulic boom and an I-R 500-cfm compressor joined forces with two track-mounted drills. One

11% Ahead at W

Phillips (left) and Morgan (center) show Williamson how planned lubrication prevented equipment breakdowns.

Williamson (left) and Morgan go over important lubrication points of truck used on Dyberry job.

of these was an I-R Crawl-IR and the other a Gardner-Denver Air Trac. Air was supplied by I-R and G-D 600-cfm compressors. All of these rigs drilled 3-inch holes to depths of 20 to 40 feet. This deep shooting helped to counteract the effect of the many natural fractures in the rock and produced effective fragmentation.

Holes were loaded with ammonium nitrate and diesel fuel together with Olin 40 per cent special dynamite, and the shots were detonated with electric caps. A Northwest 80-D shovel loaded the rock into four Euclid end-dumps that hauled to the fills.

Kiewit's northerly job got a late start last year, but it is expected to be finished on schedule by the end of this season. The rock work on this section is being done this season by the same spread that handled the rock on the other contract last year.

Access to the right-of-way was a troublesome item on this contract since the existing highway was quite distant from the new alignment. Existing logging roads were improved and graveled, and these were augmented by new roads hacked out along the right-of-way by dozers and surfaced with a little rock or gravel.

Culverts bridge drainage channels

On this contract, the major drainage channels were bridged with Armco Multi-Plate culverts instead of concrete boxes. Cat D8 tractor-dozers built roads down the steep canyon sides to the bottoms and then proceeded to clear away the unsuitable material from the culvert foundation

Clearing and grubbing starts work on the 16-mile section of U. S. 101 being located on a new alignment along the Pacific Ocean in southwest Oregon. Three contractors are sharing work on the stretch. These D8's, clearing brush and trimmings with root rakes, work along an access road for one contract.

areas. Suitable base material was brought in and compacted to give the Multi-Plate culverts a firm bed.

Trucks delivering the culvert plates were usually able to get right down to the bottoms of the canyons—sometimes with the help of a tractor. A Northwest crane assisted in assembling the sections, which were bolted together with the aid of impact wrenches. Suitable backfill material was hand-tamped around the assembled pipes with air tampers until the embankment was brought up so that sheepsfoot rollers could take over the compaction.

Much of the earthwork on this section last year was handled by dozers which side-cast the material. A spread of three DW21 scrapers and a D9 pusher were also at work.

Cross big slide area

It was on this section that the alignment crosses a huge slide. There is considerable evidence of the past movement of this big area of mountainside, with breaks showing on the upper levels and a huge mound of dirt piled up near the ocean at the bottom of the slope.

In attempting to minimize trouble for the new road, the contractor cleared the entire 200-acre slide area of trees and built terraces to provide drainage and to eliminate pockets that might collect water. The new grade is carried across the slide on a minimum fill to prevent overloading the slide.

Clear heavy timber

The second contract from the south called for the grading of a 3.93-mile section at a bid price of $1.6 million. This is the Darkenwald & Harms job. Clearing on this section got under way in April, 1958, but because of difficult access, heavy clearing, and strikes, the work is really being rushed this season to meet the completion date in the fall.

The clearing was done by a crew using D6, D7, and D8 logging tractors and Homelite chain saws. A Northwest Model 25 crawler crane decked the merchantable timber, while brush was burned on the right-of-way. Stumps in fill areas were cut to a height of

...t Winter Shutdown!

Mobil PM System Given Credit by Hunkin-Conkey for Helping Speed Up Dyberry Flood Control Dam and Reservoir Project of U. S. Army Corps of Engineers

WHEN Hunkin-Conkey Construction Company, Cleveland, O., closed down operations for the winter at the Dyberry Flood Control Dam and Reservoir near Honesdale, Pa., it was 11% ahead of job schedule. Exclusive use of the Mobil PM System and Mobil products, resulting in better maintenance organization and performance, is given a large share of the credit for this fast progress by Frank S. Morgan, Hunkin-Conkey's General Superintendent on the Dyberry job.

Major equipment in use at the Honesdale project includes 12 Euclid trucks, seven bulldozers, three mixer trucks, two tractor-mounted drill rigs, two 2½-yard shovels and a one-yard drag-line. Planned lubrication made possible the steady, day-after-day availability of this equipment—an important factor in helping Hunkin-Conkey keep ahead of schedule.

This case history clearly demonstrates the practical value of Mobil's PM System and Mobil products for contractors in saving valuable job time... boosting job profits... and in keeping their equipment working on the job *all through the job!*

R. G. Williamson, local Socony Mobil representative (center), checks Mobil PM System equipment sheet with General Superintendent Frank S. Morgan and Equipment Superintendent L. C. "Joe" Phillips.

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4. **Delivery Ticket**—lists petroleum supplies delivered to equipment on the job.
5. **"Squawk" Sheet**—used by equipment operator to point out trouble spots that may need immediate attention.

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Once an area was cleared and drainage installed, scraper spreads moved the dirt. Four Cat DW21 scrapers, helped by two D9 push tractors, get under way.

In areas where the country was not too rough, hauls were long. The Euclid heads across the fill with a load, and a D9 levels some of the dumped material.

In some of the deep cuts, rock was shot and hauled by end-dump Euclids to the fills. Spreading here is being handled by a D8.

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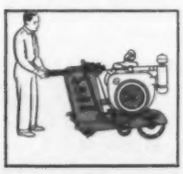

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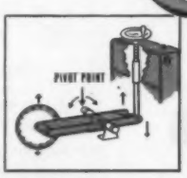

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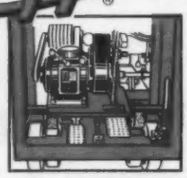

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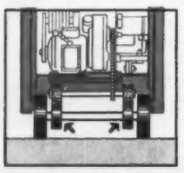

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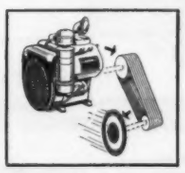

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(Continued from preceding page)

half their diameter, while those in the cuts were grubbed to get them out of the way of the scrapers.

Drainage features presented the same type of problem as on the other contracts. Among the big U. S. 6. structural-plate culverts in this contract were a pair of 96-inch culverts and one 72-inch culvert, all 672 feet long. These three were laid parallel to carry one watershed under a fill that rose to a height of 150 feet and contained 686,000 cubic yards of material. A P&H Miti-Mite truck crane assembled the structural-plate culverts. D&H also installed some five miles of 8 and 12-inch perforated subdrains.

The 2,640,000 yards of earthwork in the D&H job included some rock that had to be shot. All of the material, however, is being moved by scraper spreads, which include seven DW21 and four S-18 scrapers, together with three D9, six D8, and two HD-21 tractors.

Hold largest contract

The largest of the four contracts in dollar volume is the $2,554,000 Morrison-Knudsen contract for 3.38 miles of the grading. This is one of the largest single contracts ever awarded by the Oregon State Highway Commission. The principal work items include well over 4 million cubic yards of earthwork, 2,500 linear feet of 78, 90, and 96-inch Multi-Plate culverts, and 42,800 feet of perforated subdrains in 8 to 18-inch sizes.

Slope stakes for one of the big fills indicated a height of 310 feet from the toe to the roadway. Some of the fills extend down the mountainside to the beach, where they must have rock covering to protect them from wave action. The two largest cuts contain 1,100,000 and 900,000 cubic yards, respectively.

M-K sublet the clearing to Warren Albertson of Brookings, who used his own high-line logging equipment to bring the salable timber to a decking area that could be reached by trucks. This terrain was so rugged that it was impractical to try to use logging tractors. After the timber was removed, tractor-dozers hacked out the pioneer roads and completed the

A Cat D8 using a Hyster hoe digs a 4×4-foot trench for an 18-inch perforated underdrain that will outlet in the Pacific Ocean.

Truck trailers bringing in some of the Armco Multi-Plate sections, used to bridge drainage channels, make a stop to wait for the road to be cleared.

In the bottom of one of the canyons, crews assemble two of the Armco Multi-Plate culverts. A Gardner-Denver 500-cfm compressor supplies air to hand tools.

clearing and grubbing.

Access to parts of this section was even more difficult than to others. From a point on the old highway where the south end of the job was visible, it was a 17-mile drive over highway, logging roads, and Jeep trails to the point where crews were working.

The job of placing the subdrains was doubly difficult. The first problem was to get machines, men, and supplies down the steep canyon sides to the bottom. The second was to get a supply of granular backfill to surround the drains.

After D8 and D9 dozers built roads down to the bottoms of the canyons and dozed away the unsuitable material from the foundation areas, a D8 equipped with a Hyster hoe excavated the drain trenches. The 8-inch pipes were placed in 2-foot square trenches; the 12-inch pipes, in 3-foot trenches, and the 18-inch pipes, in 4-foot trenches. Digging these trenches in the very narrow bottoms of the deep ravines was, to put it mildly, a tough job.

The placing and assembling of the perforated metal pipe was not too difficult, but backfilling was another matter. In most cases, there was no suitable sand near the subdrain location, and the access roads were navigable only by tractor or Jeep. This meant that ordinary dump trucks could not be employed to bring in the sand.

M-K solved this problem by opening up a cut known to contain suitable sand and then assigning a D8 and 80 scraper, together with a D8 dozer-pusher, to deliver the sand. This combine would pick up a load of sand in the cut and then inch its way over the steep winding roads to the canyon where the fill was needed. These roads were so steep that the scraper needed a second D8 as a pusher to get up the grades. At the destination, the scraper dumped the sand as close to the trenches as possible, and a D6 side-dump Traxcavator placed the material around the drains. As soon as the trenches were filled, the best material available was used to continue the embankments. The big structural-plate pipes were then installed at a considerably higher eleva-

(*Continued on next page*)

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(*Continued from preceding page*)

tion to carry the creek through the fill.

Personnel

The Kiewit jobs are operated out of the company's Northwest District office at Vancouver, Wash. W. J. "Bill" Cole is superintendent of the south job, with W. E. McKenzie and John Valentine serving as assistant superintendents. Oddie Larson is engineer. Guy Scott is handling the north job.

The project manager for Darkenwald & Harms is Gus Oberg. The office manager is Earl Darrow, and the master mechanic is Gile Barlow. Robb Goble and Maurice Helean are general foremen. On the M-K project, J. H. "Jack" Coons is project manager, M. C. "Mitch" Humphries is superintendent, and Roy H. McDonald and Weslie D. Williams are general foremen.

Representing the Oregon State Highway Commission on the respective contracts, from south to north, are resident engineers H. S. "Cy" Cox, Larry Rulien, R. L. "Bob" Lammert, and George Barnhart. Their assistant resident engineers are T. W. Litchfield, Bobbie D. Johnson, and Bob Bailey. All of these men report to division engineer Frank D. Morgan of the Roseburg Division. Tom Edwards is construction engineer for the Oregon department, and W. C. Williams is state highway engineer.

THE END

Welding school for users of road-building rigs

The theory, techniques, and methods of hardfacing and resurfacing metal parts through the automatic-welding process are being taught at a training center opened by Automatic Welding Co. in Waukesha, Wis. Students are taught how to resurface rollers, idlers, tracks, and wheels; how to hard-finish shafts and other equipment; and the machining necessary to maintain original specifications after the repair work has been done.

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Full details may be obtained by writing to the Automatic Welding Co. Training Center, P. O. Box 331, Waukesha, Wis.

ARBA bulletin on slag for skid-proofing roads

The use of blast-furnace slag for producing nonskid road surfaces is discussed in "Skid-Proofing City Streets, County and State Highways Using Blast Furnace Slag." The illustrated bulletin is an adaptation of a paper presented at ARBA's 1959 convention by E. W. Bauman, managing director of the National Slag Association.

Copies of Technical Bulletin No. 241 may be ordered for $1 each from the American Road Builders' Association, World Center Bldg., Washington 6, D. C. Each ARBA member is entitled, upon request, to one free copy of the bulletin.

A 6-INCH-THICK BASE COURSE of asphaltic concrete is placed on the McGrath Highway and Middlesex Fells Parkway, Boston, by a rubber-tire Blaw-Knox paver-finisher. Reconstruction of this 2.3-mile section was subcontracted by National Contractors of Somerville, Mass.

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INTERNATIONAL TRUCKS

WORLD'S MOST COMPLETE LINE

Henry E. Beretta, a specialist in ecclesiastical wood carving and head of Master Woodcraft Co., New York City, works on a door of a confessional in the Church of Our Savior, in New York City. Beretta designed and carved "in the round" the statue of Christ, background.

Wood carving project for church is New York's largest in 20 years

Speciality work that has almost fallen into disuse in modern times has been given its greatest revival in the Church of Our Savior in New York City. The ornamental plastering, stone carving, and wood carving for the church are some of the largest jobs of their kind undertaken in New York in 20 years. And because of the increasing scarcity of craftsmen, this may well be the last big use of these specialties in a project of this size.

Only six wood carvers, 70 years of age and over, could be found who were qualified to do this work, and many of them had to be persuaded to come out of retirement for the project on Park Ave. at 38th St. The men were under the direction of Henry E. Beretta, a specialist in ecclesiastical wood carving and head of Master Woodcraft Co., New York City.

Wood carving

Three steps are involved in producing a wood carving. First, the architect makes a scale drawing; then a full-size drawing is made. From this a clay model is sculptured so that it can be criticized by the architect. Since the clay is soft, final changes are easily made. Finally, a cast of the clay model is made of plaster of Paris. It is from this that the wood carver works. Even if a design repeats itself many times, the wood carver works from only one plaster cast.

The best woods for carving are oak, basswood, and limewood. White Oak is used for ecclesiastical work, as well as for pews, since it is one of the strongest and handsomest of woods. All of it is kiln-dried before use.

In the Church of Our Savior, the wood carving job includes a narthex screen, 30 feet long and 15 feet high; 250 feet of cresting along the top of the wainscoting running around the nave; four confessional doors; ceiling ornaments in the narthex; six angels; details in the baptistry; and some lesser items.

Dying craft

Beretta states that the New York Metropolitan area has only about a dozen top craftsmen—so few that they no longer have a union. About 50 years ago, there were 50,000 wood carvers in the city. Today the survivors belong to the Carpenters Union.

One of Beretta's assistants, 70-year old Severo Ayuso, declares, "It takes five years before you can call yourself a beginner. A man can consider himself a good carver after 25 years' experience."

Typical career

Typical of the careers of the few master wood carvers left is that of Beretta. Born in Italy, he learned the craft from his father. In 1926, Beretta came to this country, worked as a helper for three years, and in 1930 opened his own shop. Some New York City churches in which his work is represented are the Lady Chapel of St. Patrick's Cathedral, St. John the Divine, and the Little Church Around the Corner. THE END

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Real money savers that bring brand new economy to V-8 operation! They deliver astonishing mileage from regular gas . . . smooth, lively power with next-to-no oil consumption. Proved by tests. Proved on actual truck jobs. Optional in new INTERNATIONALS from light-duty pickups to medium-duty stakes to heavy-duty six-wheelers.

Shipped within 24 hours of order from INTERNATIONAL Truck Sales Processing Center! This new INTERNATIONAL model BCF-182 six-wheeler, with 96-in. bumper-to-back-of-cab dimension and 28,000 lb. tandem axle, is equipped with body, hoist, frame reinforcements . . . all the standardized equipment you need! Besides *fast delivery* it offers "take-any-terrain" ruggedness and easy-handling maneuverability for "tight" working conditions . . . husky "six" or V-8 power. Ask your INTERNATIONAL Dealer for full details.

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Labor review

Houston-Galveston contractors move to stabilize labor-management relations

Contractors in the Houston-Galveston area took the first step toward stabilizing labor-management relations in the Gulf Coast construction industry by forming the Employers' Council for the Houston-Galveston Area.

Aim of the council is to coordinate the labor policies of its contractor bargaining groups and "strive during 1959 to develop a closer working relationship with the Houston and Galveston Building and Construction Trades Council, AFL-CIO."

The council hopes the relationship will lead to the unions' adoption of the 10-point program mapped out by the AFL-CIO Building Trades Department in February, 1958. The 10-point program is against standby crews and featherbedding practices; bars strikes, work stoppages, or lockouts during the processing time of a grievance; and espouses the settlement of jurisdictional disputes without work stoppages.

Labor Department rules on wage determination for Erie, Pa., iron workers

Contractors in the Erie, Pa., area are officially advised by the Labor Department that the prevailing rate for iron workers in that area is still $3.64 an hour.

The letter, addressed to John E. Britton, attorney for the Erie Construction Council, Inc., notes that the iron workers had been told earlier that a $3.89 rate would be established. James R. Beaird, acting assistant solicitor, explains: "It had been our experience that prevailing rates for iron workers in Jamestown, N. Y., and Erie had been the same for some time, and the letter was predicated upon the assumption that this was still true in 1958."

However, Beaird adds, after being notified of the current contract dispute between Erie iron workers and contractors, the Department took another look at the rates and decided that $3.64 was still the prevailing rate for structural, ornamental, and reinforcing iron workers.

First batch of contracts is wrapped up in northern New Jersey

The first of a batch of collective-bargaining agreements is wrapped up in northern New Jersey with new 3-year contracts for carpenters, bricklayers, and laborers in Monmouth and Ocean counties; however, it is said by an employer spokesman that these agreements will not set a pattern for the state, because the two counties traditionally have been low-wage areas, and this year's settlements bring crafts more into line with workmen in other sections.

The Monmouth-Ocean settlements all provide first-year raises of 25 cents an hour, and 20 cents more in 1960 and again in 1961.

None of the northern New Jersey crafts have bought the no-strike, no-lockout proposition made earlier this year by the Building Contractors Association; however, Paul J. Brienza, managing director of the employer group, says indications are that there will not be a repeat of last year's costly series of strikes.

"Several hundred" members of Missouri road workers signed up by teamsters

Missouri teamsters move to pin their union button on the estimated 2,200 employees who maintain the state's roads.

The drive, claims William C. Schneider, assistant to Harold J. Gibbons, teamster vice president and head of Teamsters Joint Council 13, has already netted the union "several hundred" members. The Missouri campaign is understood to be part of the nation-wide drive to organize state and municipal employees announced earlier in the year by teamster president James R. Hoffa.

The maintenance employees have been solicited in the past by the operating engineers and the state, county, and municipal employees. A Missouri highway commission official is quoted as going along with the employees' right to join a union but doubting the legality of any strike or the commission's right to sign a collective-bargaining agreement.

Bricklayers rewrite national pact; local contractors squawk

A mounting wave of local protest to the recently revised national agreement between the Bricklayers Union and the National Constructors Association is reported. The reason: a clause specifying that there will be no work stoppages on national employers' projects if the union strikes local employers over wages or working conditions.

The clause, characterized as "a real strikebreaker" by one local contractor, reads as follows:

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"When the employer enters an area where wages and working conditions have been negotiated through bona fide collective bargaining, the employer will be presented with such evidence by the union and the employer will conform his operations accordingly.

"After the employer's operation has commenced in any such area, no subsequent change in wages or working conditions in such area will become effective insofar as the employer is concerned, except to the extent that any such change in wages or working conditions may have been agreed upon in negotiations between the local union having jurisdiction over the area and a recognized bargaining agency of contractors in such area. Employer agrees to accept the new wage rates and working conditions so agreed upon and pay rates retroactively to the effective date so agreed upon. Pending completion of such local agreement, there shall be no stoppage of work on employer's projects by the union or any lockout by employer by reason of any dispute over wages or working conditions which may occur between such local union and other contractors than employer."

Where a national contractor goes into a nonunion area, the national agreement states that wages and working conditions will be negotiated; however, according to the agreement, disputes are to be referred to the International Union and the contractor's home office for arbitration.

Laborers, mason tenders settle with builders group in Springfield, Mass.

Contract negotiations between the Building Trades Employer Association of Springfield, Mass., and three unions continued as settlements were reached with the laborers and mason tenders.

Both new pacts became effective April 1, for a 3-year period, and provide pay raises of 12.5 cents in the first year and 10 cents in the second and third years. Laborers were receiving $2.32½ an hour, while mason tenders got $2.59½ before the wage increase became effective. No changes in fringe benefits have been made, according to an association spokesman, and none of the contracts include provisions for exclusive union hiring halls.

In addition, the association is bargaining for the first time with the newly formed Pioneer Valley District Council of Carpenters. In these talks the association represents Northampton, Mass., employers. The district council also bargains in Easthampton and Greenfield.

Arizona iron workers prepare new demands pending contract expiration

With most of Arizona's basic trades reportedly on the verge of agreement on new contracts with the Associated General Contractors, another union, Iron Workers' Local 75 prepares its demands, pending the June 31 expiration date of its contract.

However, negotiations are not expected to get under way until July 1, according to a union official. The union will then put in a bid for inauguration of a paid-vacation plan. The fund would be established with a 10-cent-an-hour contribution per employee. Present fringe benefits already include 10 cents for health-welfare and 10 cents for pensions.

The union also wants wages raised to bring Arizona iron workers into line with their fellow-craftsmen in California. The union wants a 40-cent-an-hour pay boost for a 2-year agreement, or 65 cents for three years. Reinforcing iron workers now receive $3.40 an hour; structural and ornamental iron workers get $3.65. The agreement also provides for $7 daily subsistence pay.

Carpenters and contractors in Portland, Maine, reported at a stalemate

Negotiations between the Portland, Maine, Associated General Contractors and the carpenters were at a stalemate after several meetings in the presence of a conciliator.

The union is asking for a 2-year pact, to replace one that expired January 1, with 15-cent hourly wage raises in both years. According to an AGC spokesman, the contractors "have nothing to offer." He said the number of union contractors in Portland has decreased from 17 to 3, and even now 95 per cent of the work is going to nonunion contractors. "Any increase at this time would be suicide," he asserts.

Meanwhile, Maine contractors have asked Local 4 of the operating engineers, Boston, Mass., for a separate contract, but they report that their proposal has been rejected. An AGC spokesman said the engineers, who currently are negotiating with the Massachusetts Contractors Association, refuse to discuss any proposals for other than a regional contract. He said Maine contractors have never signed the Massachusetts contract, but have paid the Boston rate, which is presumably higher than what would be set by separate negotiations. The Massachusetts Contractors reportedly have refused to negotiate for Maine, claiming that conditions are different.

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- SPECIFICATIONS:

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Chemically resistant to chlorinated water, salt water, acids, alkalis, sewage wastes, oil, etc.

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A Mack B-63 10-wheeler dumps to a Cedarapids paver—one of two rigs putting down the 6 inches of asphalt-stabilized base course in three 2-inch lifts for the 10-mile section of road near Cheyenne, Wyo. Urban and suburban sections of the road were paved with concrete.

Asphalt-stabilized base placed in three courses

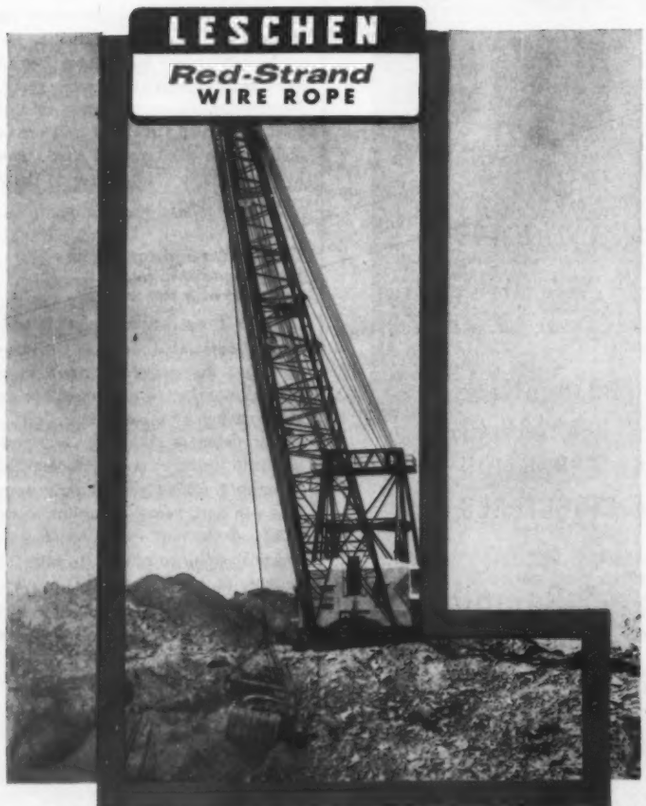
The placing of 80,000 tons of asphalt-stabilized base course, plus the asphaltic-concrete surfacing on a 10-mile section of interstate highway in and near Cheyenne, Wyo., called for a setup with a high production rate and the ability to keep working steadily throughout the season. Schmidt Construction Co., Inc., Arvada, Colo., met this challenge with a Pioneer hot-mix plant and a laydown spread to match.

On connecting sections of paving, Northwestern Engineering Co., Denver, placed concrete paving for suburban and urban sections of the same highway. A portion of this concrete pavement was laid without fixed forms by a Quad-City formless paver.

Several contracts, with a total value in excess of $8.3 million, provide this segment of interstate highway with a completely new alignment for nearly 20 miles through Cheyenne, then northward. Three distinct roadway designs mark the transition from urban to suburban to rural sections.

when the going gets rough-

give 'em "L"



When the bite is on the dragline, you'll be glad you rigged with *Leschen*—the wire rope that's the same top quality in every foot of every reel. The new Leschen wire mill is designed to deliver exactly that. New machines . . . new processes . . . exclusive new continuous-flow technique—all as modern as tomorrow. Try Leschen Red-Strand Wire Rope now and see how its uniform quality makes your operation safer, your replacement time farther in the future. Make your next order Leschen! *Leschen Wire Rope Division, H. K. Porter Company, Inc., St. Louis 12, Mo.*

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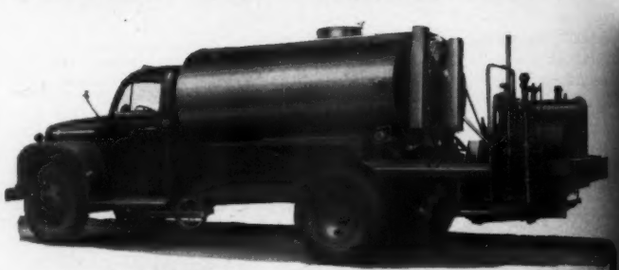

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The Model 424-56 is built in 1000, 1250 and 1500 gallon capacities as standard and can be furnished in other capacities, either truck or semi-trailer mounted.

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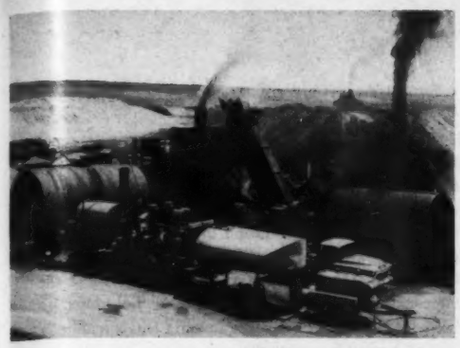

A Pioneer No. 99 central-mix plant works at a rate of 160 to 200 tph to produce the material needed for the project. At right is the 382 dryer and dust-collector unit. In the foreground is a unit with a Hy-Way hot-oil heater.

Following the breakdown roll, additional compaction is supplied by a Bros 9-wheel self-propelled rubber-tire roller ballasted to 8 tons. Final rolling was done the following day.

A Huber 8-ton tandem pauses for its daily lubrication. The lube rig, on a Ford, carries five Lincoln service reels and pumps. The Kohler light plant is for night lighting and power tools.

Three roadway sections

The divided highway for the urban area has two 24-foot roadways paved with 9 inches of concrete. Separating the roadways is a 15-foot paved median flanked by 18-inch curb-and-gutter sections. Outside shoulders are 10 feet wide and are paved with 4 inches of bituminous surfacing.

As the highway moves into a suburban area, the median changes to grass and widens to 24 feet. On the inside edges of the 24-foot-wide concrete pavements are 5.5-foot shoulders. Outside shoulders are 10 feet wide with bituminous surfacing. In this area there is an extensive sprinkler system that includes two 14-inch pumps.

Only one-half of the eventual divided road was finished under these contracts in the rural area. The grading section was finished 44 feet wide. Over this, the contractor placed a 6-inch asphalt-stabilized base in three 2-inch courses. The 24-foot-wide roadway section was then finished with a 1½-inch course of asphaltic-concrete surfacing. Schmidt's contract included the paving of 10 miles of this rural section, plus construction of bituminous shoulders on 6.6 miles of the urban and suburban sections.

Asphalt-stabilized base

Starting work on a grade that had been built the previous season, Schmidt's crews first had to repair a number of soft spots that had developed with the penetration of the frost and winter moisture. An Allis-Chalmers HD-9 Tracto-Shovel dug out these soft spots, and new stable material was backfilled and compacted to correct them. Some early summer rains occurred while the holes were open and complicated the repair problem. The additional moisture created soft spots within the soft spots and necessitated still more excavation and backfill.

When the faults in the grade had been corrected, the surface was primed with MC-O cutback asphalt at a rate of 0.35 gallon per square

(Continued on next page)

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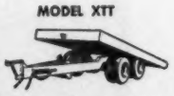

Tandem axle tilt trailer (tow type), capacities 13 through 20 tons.

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Heavy-duty tandem axle with adjustable bolsters. Telescopes from 16' to 30' from tractor.

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Gooseneck type, tandem axle tilt-trailer. Capacities 14 through 22 tons.

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Dual axle drop bed semi, capacities 15 through 30 tons. Drop deck or flat deck.

MODEL PX

Heavy-duty tandem axle, spring mounted platform or float.

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Multiple axle drop bed semi, capacities 35 through 75 tons. Drop deck or flat deck.

MODEL GPR

Removable gooseneck. Tandem, triple or trunnion axles. Flat or drop decks, or as beam trailers.

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Tandem axle. Capacities 16 through 35 tons. Drop deck or flat deck.

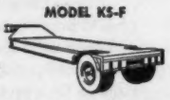
MODEL T-8-18

18 or 18 foot length beneath the wheel tilt trailer. 8-10 ton capacity.

MODEL TT

Heavy-duty tilt trailer. Capacities 6, 8 and 10 tons.

MODEL KS-F



Single axle flat bed semi, capacities 10 through 20 tons. Drop deck or flat deck.

MODEL GTX

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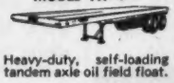

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Some 8 to 9 miles of the concrete paving in urban and suburban sections of the road were handled by this Quad-City slip-form paver. A small amount of hand finishing is being done between the moving forms of the rig.

(Continued from preceding page)

yard. An Etnyre 1,500-gallon distributor on a Ford truck handled this operation and the sealing operations that followed the laying of the pavement.

Schmidt then began laying the three 2-inch courses of asphalt-stabilized base. The single-aggregate mix, containing ¾-inch-maximum aggregate and about 4 per cent of 85 to 100-penetration asphalt, was mixed in a Pioneer Model 102 asphalt plant.

A Cat D8 tractor with U-dozer fed the aggregate from the stockpile to a trap, where a 38-inch apron feeder placed the materials on the cold elevator leading to the Pioneer 382 dryer and dust-collector unit. The heated and dried aggregates went to the gradation unit of the No. 99 central-mix plant. Calibrated feeders delivered measured amounts of the materials from the hot bins to the conveyor feeding the continuous pugmill mixer.

Asphalt cement was trucked to the plant from the Frontier refinery in Cheyenne in a 5,000-gallon transport. At the plant, it was stored in trailer-mounted storage tanks heated by a Hy-Way hot-oil heater. The hot-oil heater and a GM 275-kw diesel generating unit were mounted on a flat-bed trailer that also carried a large fuel tank serving both machines.

The aggregates for the hot-mix were produced in a pit adjacent to the plant site. A dragline fed the gravel to a hopper, and a conveyor carried the material to a Cedarapids screening plant. Oversize went to a Cedarapids Commander crushing and screening plant that produced the aggregates directly. Trucks hauled to the stockpile, which was built with dozers.

The hot-mix plant turned out 100 to 200 tph under usual operating conditions. A maximum of ten trucks, including Schmidt's Fords and Macks and some hired trucks, was used to haul the mix from the plant to the laydown crew.

On the road, two laydown machines placed the mix as fast as it was delivered. One of these was a Barber-Greene and the other a Cedarapids. A Huber 8-ton tandem roller followed the laydown machine making the first pass. It was followed by a Bros 9-wheel self-propelled rubber-tire roller ballasted to 8 tons. The final ironing of the course was done by a Buffalo-Springfield 3-wheel tandem.

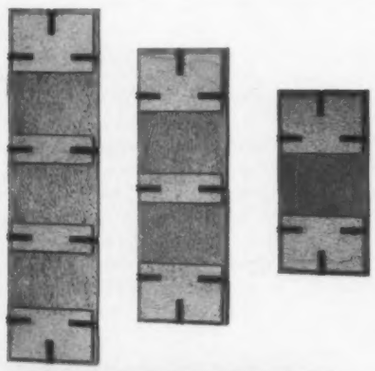
Bituminous surfacing

On the 6 inches of asphalt-stabilized base, Schmidt placed a 1½-inch course of asphaltic-concrete surfacing 38 feet wide. Gradation specifications, tighter for the surfacing material, required the use of two aggregates in the plant feed. An additional 38-inch Pioneer apron feeder and conveyor brought material from the second stockpile to the cold-feed elevator. The surfacing mix contained ½-inch-maximum aggregate and about 6 per cent of the 85 to 100-penetration asphalt cement. Placing operations were similiar to those for the base work, but surfacing was laid in a single 1½-inch course.

Shoulders for concrete

Another phase of this contract was the construction of the bituminous-surfaced shoulders for the suburban and urban sections of the project, where Northwestern Engineering Co. had placed the concrete pavement for the travel lanes.

The shoulders were built up to



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The basis of All-Ply superiority and speed is ONE working part (the unique Combination Clamp) which does four separate jobs. A hammer is the *only* tool required for erection and stripping. The absence of frames permit easy stacking and transporting in minimum space. Long life and many re-uses are assured.

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within 4 inches of finished grade with stabilized aggregates. This material was loaded from a stockpile to trucks by a Kolman reciprocating feeder and 42-inch belt conveyor. The material had been wet when the stockpile was built, and additional moisture was not required. As the base material was spread beside the pavement, it was compacted by rubber-tire rollers and Essick vibrating rollers.

The compacted base was given a prime shot of MC-O cutback asphalt ahead of the paving. The 4-inch asphaltic-concrete paving was placed in two 1½-inch courses and a 1-inch course. One of the laydown machines placed the base-course surfacing on the shoulders. The plant-mix was laid with a Miller spreader box.

Two types of sealing were tried to delineate travel lanes and shoulders. On a 6-mile section, the 24-foot travel lanes are sealed with RC-3 cutback asphalt and covered with light-colored chips; the shoulders are left black. On an adjacent 3-mile section, the shoulders are sealed while the travel lanes remain black. This gives highway officials and the driving public an opportunity to observe both types and will aid in formulating a policy for future construction.

Concrete pavement

Northwestern Engineering Co., Denver, placed the concrete paving on the urban and suburban sections of the project under a $1,444,444 contract. Between 8 and 9 miles of 24-foot roadway were placed with a Quad-City slip-form paver. The remainder of the job was done with conventional forms and equipment.

On the latter portion, the contractor used 3,000 road-feet of Heltzel 9-inch forms. A Cleveland Formgrader prepared the grade for the forms, and Cleveland form tampers compacted the material around the bases after forms were set and pinned.

To prepare the base, a Cat No. 12 motor grader straightened up between the forms, and a Cat 977 Traxcavator pulled a trail blade for final strike-off. A Buffalo-Springfield tandem roller compacted the base ahead of the paver.

Leading the paving train was a Rex dual-drum 34-E paver. A similar paver served as standby and also mixed small amounts of concrete needed for other operations. Riding the forms behind the paver were a Blaw-Knox paddle-type spreader, a Jaeger transverse finishing machine, and a Heltzel Flex-Plane float-finisher.

When the slip-form paver was used, the base was carefully graded and compacted by the motor grader and roller, leaving it in as near perfect condition as possible. The Rex paver then placed the mix ahead of the Quad-City machine, which completed the finishing.

Hunt Process white-pigmented curing compound was applied to the finished slab by a hand-held spray supplied from a power pump. Joints were sawed by single-blade Concut saws, and the joints were filled with hot poured compound. Curing, sawing, and sealing were done by Hunt Process Co. under a subcontract.

The mix for both types of paving was batched from a Heltzel batch plant. Two sizes of aggregates were received at the plant by rail and transferred to stockpiles by a Barber-Greene under-car unloader and conveyor. A Cat D8 also assisted in maintaining the stockpiles.

(Continued on next page)

At an interchange, a Rex paver is fed by a Mack 10-wheel batch truck. A Blaw-Knox paddle-type spreader follows. The freeway crosses on the bridge in the background.

Where SPECIFICATIONS call for . . .

HIGH DEGREE SOIL COMPACTION

PHOTOS: *Left*—Tamping fill around 4 ft. concrete pipe culvert on New York State Thruway Extension near West Seneca, N. Y. *Right*—Compacting earth fill around abutment on Benbrook Dam construction near Fort Worth, Texas.

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YOU can't get *high degree* SOIL COMPACTION by "patting it" or "shaking it." For deep, penetrating force to produce 95%, 97.5%, or even 100% compaction, Barco Rammers are THE ANSWER. For many soil conditions, they are the only answer.

THE KEY TO BETTER CONSTRUCTION—High degree soil compaction is worth every cent it costs. Barco Rammers are especially effective for compacting fill in restricted areas—close to walls, culverts, abutments, around footings, and in trenches—on all kinds of construction jobs: Toll Roads, Freeways, and Highways; Air and Missile Bases, Hydro-electric Power and Flood Control Dams, Bridges, Buildings, and Housing Developments.

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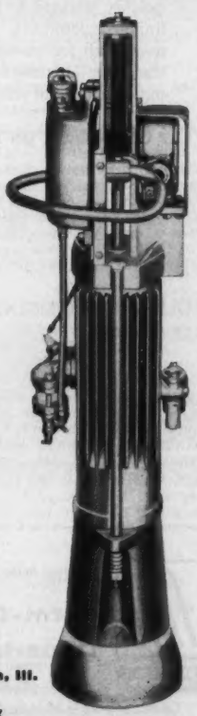

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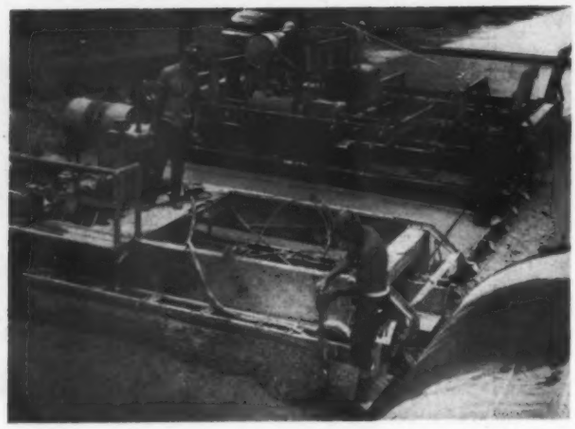

Following the spreader in the conventional spread is a Jaeger finisher. Just behind is a Heltzel Flex-Plane float-finisher. This concrete work was handled by Northwestern Engineering Co., Denver.

For more facts, use postcard on insert, or circle No. 314.

(*Continued from preceding page*)

Aggregates were charged into the plant bins by a Bucyrus-Erie 38-B crane using a 2-yard clamshell bucket. Batches were weighed out into 9 Mack trucks carrying 5 batches each. After receiving the aggregates, the trucks moved to a separate 600-barrel cement plant where the charge of cement for each batch was placed in a separate covered conveyor.

Water for the mix, obtained from a well, was hauled by two Mack trucks with 3,500-gallon tanks. A 3,500-gallon tank-trailer was pulled by the paver, and the nurse trucks replenished the supply in the trailer. Ad-Aire admixture was added at the mixer to give the concrete an air content of approximately 4 per cent.

Northwestern's crews turned out 85 to 90 batches of concrete per hour and paved 1,300 to 1,500 linear feet of the 24-foot-wide 9-inch-thick roadway per 8-hour day.

Work for Schmidt Construction Co. on the base and hot-mix surfacing was supervised by superintendent W. C. "Cas" Austin. Plant foreman was J. A. Morris, and laydown foreman was Wayne Austin.

The superintendent for Northwestern Engineering Co. was Fred E. "Slim" White. Other supervisors on his staff were "Red" Kinzley on the fine-grading, Cecil Osborne on the concrete placing, and Nick Miller in charge of the batch plant.

The resident engineer for the Wyoming State Highway Department on the entire project was A. L. Putnam. John Niles was in charge of the entire surfacing contract for the department. Warren A. Gallup is district engineer of the Cheyenne District, R. G. Stapp is state construction engineer, and J. R. Bromley is chief engineer of the department.

THE END

I-H to buy equipment from two companies

Certain equipment produced by the Danuser Machine Works, Tulsa, Okla., and the Danuser Machine Co., Fulton, Mo., will be purchased by International Harvester Co., Chicago, for use with its line of wheel-type commercial tractors. I-H will supply that equipment to its dealers and company-owned retail stores.

The I-H Danco center-mounted commercial rotary mowers are made by Danuser Machine Works; and the I-H Danuser rear-mounted blades, scarifiers, and scoops are made by Danuser Machine Co. There is no operating relationship between these two companies, even though the names are similar.

Prior to this arrangement, both companies sold these products direct to I-H dealers and stores.

Hawaii has marketed a $14 million territorial bond issue for improvements at Honolulu airport on the island of Oahu. Unlike state bonds, territorial bonds are exempt from state income taxes, as well as federal taxes.

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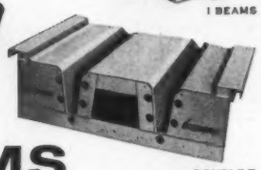
I BEAMS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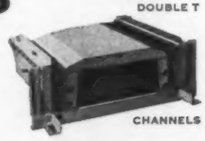
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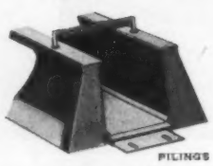
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The Form-Crete line basic forms represents the most versatile group of steel forms ever produced for casting prestressed and precast concrete products. Each form has been carefully designed to insure a uniform, smooth product with every pour. Heavy-gauge steel construction means longer form life. What's more, many Form-Crete forms can be quickly adapted to produce a variety of finished products. And where special needs call for custom forms, FMC has the know-how and facilities to turn them out quickly and efficiently.

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Two modern plants, Lakeland, Florida in the east and Riverside, California in the west, have full facilities to turn out the forms you require when you need them. Shipments can be scheduled to meet your requirements. Call on Form-Crete, rely on Form-Crete for the finest in all-steel forms all the time.

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Long known as the pioneer manufacturer of all-steel forms, Form-Crete engineers have years of valuable experience to offer you. This free engineering service is made without cost or obligation. Oftimes a standard form can be modified to meet your needs. And if a custom unit is required, Form-Crete engineers have the know-how to produce it for you in the shortest time.

NEW! FROM FORM-CRETE!
Single T Slab Form

The latest in design, this new Single T permits castings with slabs six or eight-feet in width. Special design feature permits form to be swung back slightly, allowing easy removal of product. Write for more information.

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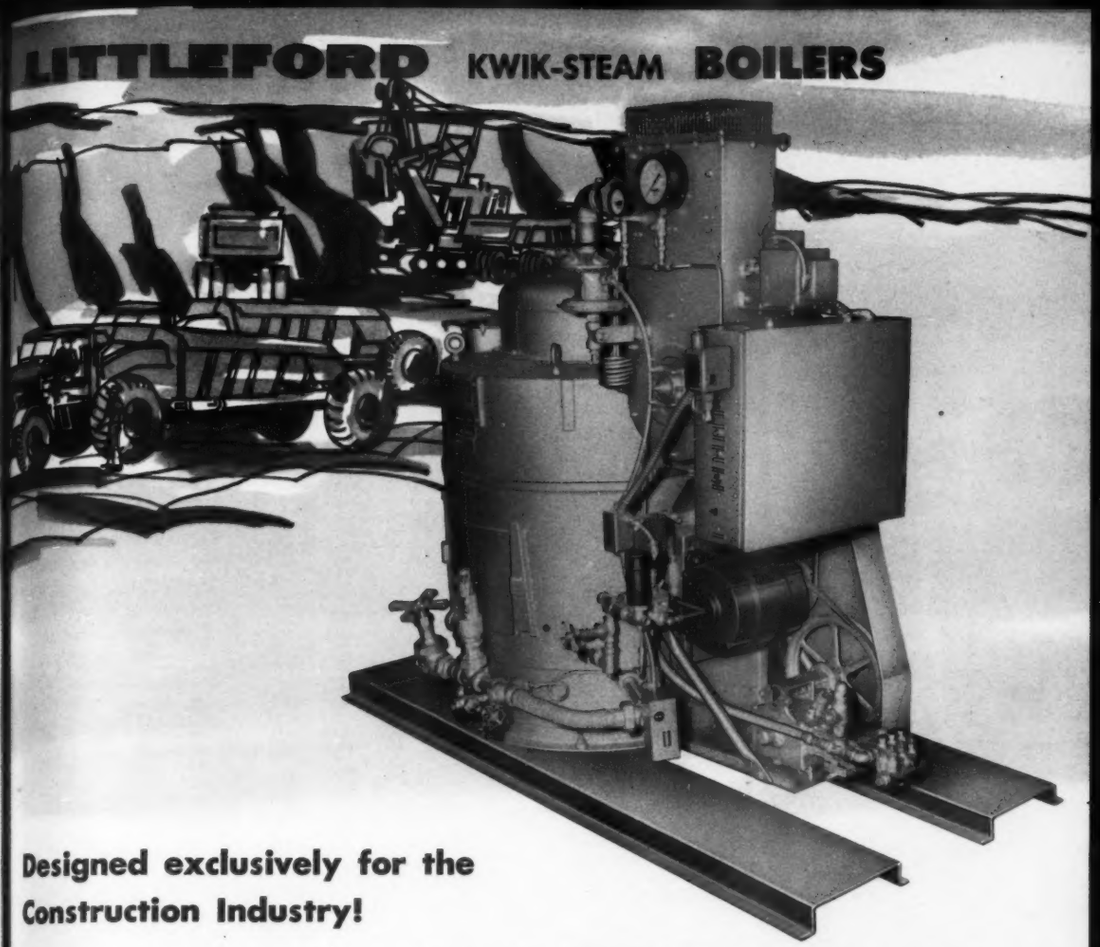
LITTLEFORD KWIK-STEAM BOILERS



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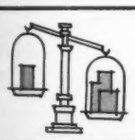

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Littleford's "Kwik-Steam" Boilers produce full steam pressure in two minutes time . . . thus reducing both labor and operating costs by producing steam only when it is needed. Boiler is compact in size, light in weight, and easily located near its source of use. Six different sizes—20 to 150 BHP.

Find out for yourself how this Boiler can increase your production and at the same time reduce your overhead. For full information on how you can increase your profits with the use of a Littleford "Kwik-Steam" Boiler request Bulletin 22 on the postage paid air mail reply card at the bottom of this page.

LITTLEFORD BROS., INC. • 457 EAST PEARL STREET • CINCINNATI 2, OHIO

I should like additional information on how Littleford's "Kwik-Steam" will help me with the following:

- ☐ Ready-mix concrete operations
- ☐ Concrete products curing
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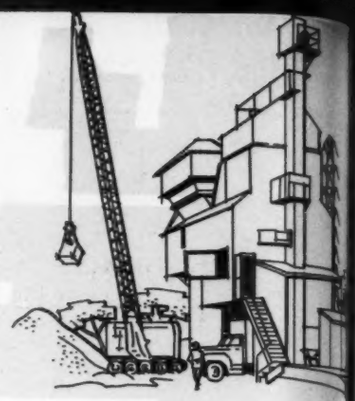
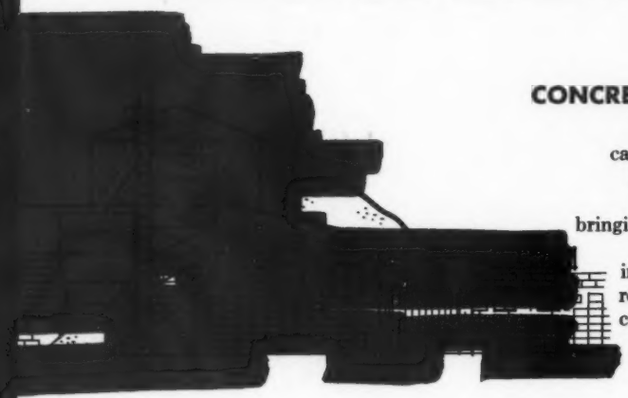
The Littleford Kwik-Steam Boiler permits operation of ready-mix plants the year round at a lower cost than ever before possible. With Littleford Kwik-Steam Boiler, fuel is consumed only when the Boiler is producing steam . . . does not require an operator on a 24 hour basis . . . there is no expensive installation. These are just a few of the many features that make the Littleford Kwik-Steam Boiler the most practical, economical and maintenance-free unit available for ready-mix concrete.





CONCRETE PRODUCTS CURING

Concrete block and prestressed concrete production can be increased by the use of the Littleford Kwik-Steam Boiler. With the Littleford Kwik-Steam Boiler you can produce a greater amount of moist heat in your kiln bringing the temperature up in a much shorter time, thereby, cutting down on the amount of steam you require and increasing the output. Wetness of steam may be quickly regulated by increasing or decreasing the amount of fuel consumed and there is no expensive operation when unit is off . . . these are two big reasons the Littleford Kwik-Steam Boiler will mean greater profits for you.

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The Littleford Kwik-Steam Boiler is a compact, light weight, economical unit that produces high steam pressure quickly and can easily be moved on the job. This unit will produce full steam pressure in two minutes from a cold start thus doing away with the expensive operation of starting boilers hours in advance of actual work. Only the Littleford Kwik-Steam Boiler offers you instant steam when you need it.

For additional information on how the Littleford Kwik-Steam line of Boilers may help you increase production and profits simply return the attached air mail reply card on the other side of this page.

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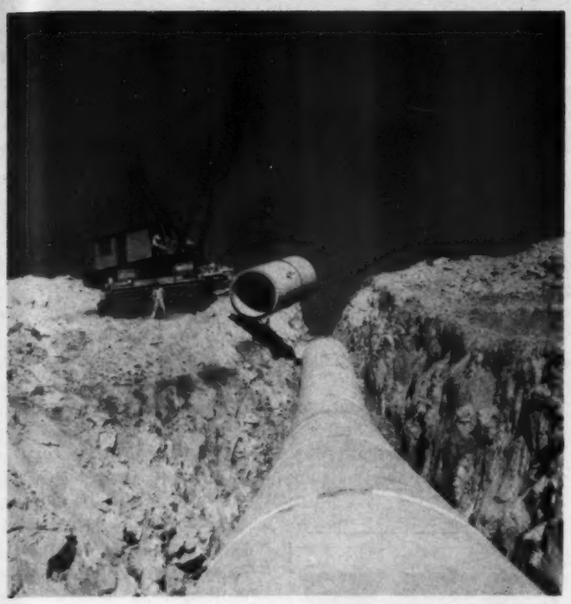


A section of 75-inch concrete pipe is lowered into a rocky trench for this part of the San Diego Aqueduct. The heavy timber wedge levels the crane on this 47 per cent slope.

Contractor lays pipe through steep slopes

The course of the second San Diego Aqueduct, now under construction, is anything but smooth. Many steep slopes through rocky canyons and ridges must be blasted for the trench. Although the line runs through miles of hills and relatively level land in its 100-mile southerly course from the Metropolitan Water District of Southern California's Colorado River Aqueduct to the San Diego Lower Otay Reservoir, it also hits steep slopes.

One of the contractors, Vido Artukovich & Son, Inc., El Monte, Calif., ran into a 47 per cent slope on one section. Rock formation close to the surface made benching impractical, and the contractor used a heavy timber wedge to level the crawler crane. A train of three Caterpillar D8's helped the crane move up the slope to lay a new section of the 75-inch concrete cylinder pipe, supplied to the job by United Concrete Pipe Corp.

ASLE elects Gurgo to board of directors

M. M. Gurgo has been elected to the board of directors of the American Society of Lubrication Engineers. He will serve as industrial director of the society until April, 1960.

Gurgo is associated with Esso Standard Oil Co., New York City. He is a coordinator in the sales service laboratory of the company's Pittsburgh, Pa., office.

Goodrich presents gifts to private universities

Gifts totaling $50,000 have been made to five privately financed universities by The B. F. Goodrich Co., Akron, Ohio. The unrestricted gifts of $10,000 each have been made to Harvard, Yale, Princeton, Cornell, and the University of Chicago. The gifts are a part of the company's program of aid to higher education.

Manhattan service branch opened by Black & Decker

The Black & Decker Mfg. Co., Towson, Md., has opened a factory service branch at 227 Varick St., New York City. The new branch will supplement the service facilities of the firm's present branch at Woodside, Long Island, N. Y.

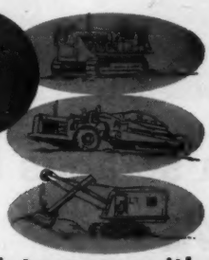
Dan E. Calabrese has been appointed assistant branch service manager of the new facility.

Blaw-Knox paving film

"Paving Modern Concrete Highways," a 16-mm color film released by the Blaw-Knox Co., depicts base laying; form setting; subgrading; cement and aggregate batching; paver, spreader, and finisher operation; form stripping; and shoulder widening.

Film No. STF-107 is available on loan to engineers, contractors, and civic groups from the Sales Promotion Dept., Construction Equipment, Blaw-Knox Co., 300 Sixth Ave., Pittsburgh, Pa.

There's a right time for down-time!



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For more facts, use Request Card at page 18 and circle No. 245

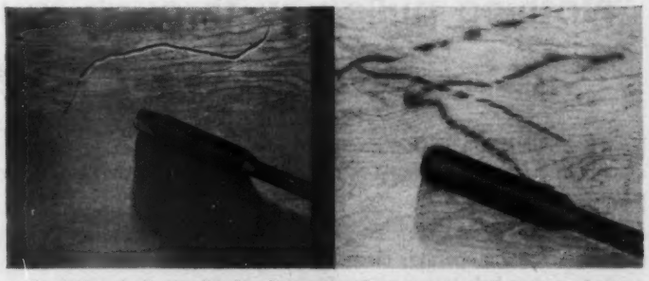
Only Viber offers you Vibrator heads with Interchangeable rubber or steel tips!

Eliminate expensive grinding...insure a perfect finish on exposed concrete surfaces...make costly forms last longer...extend the life of vibrator housings!

Tips screw on or off vibrator head easily, quickly...may be interchanged as required, replaced when worn.

YOU MAKE MORE PROFIT with Viber Vibrators! Viber replaceable rubber tips end damage to concrete forms and make forms last longer. By eliminating scarring of form faces, Viber rubber-tipped vibrators put an end to grinding and hand finishing of blemishes caused by gouged forms. Vibrator housings last longer because most wear occurs at the tip, which is replaceable.

TAKE YOUR CHOICE! Many contractors prefer steel-tipped vibrators for very harsh concrete with large aggregate, but the majority of Viber owners use rubber-tipped heads on *all* jobs. Whatever your preference, Viber (and ONLY Viber) gives you a choice of rubber OR steel—and lets you interchange them at will. WHY NOT WRITE TODAY for the whole story!



Steel tipped vibrator heads often cause deep gouges and scars on form faces (left), producing blemishes on exposed concrete surfaces and requiring expensive grinding and hand finishing. Rubber-tipped heads don't damage form faces any more than a rubber eraser (right), extend form life, produce smooth finish concrete, eliminate hand finishing.

Viber Company, 726 South Flower Street
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California

VIBER CO
VIBRATORS
Pioneers and leaders in the manufacture of vibrators.

For more facts, use Request Card at page 18 and circle No. 246

Excavation and grading of launching sites for Atlas ICB and Thor IRB missiles is being done by an International Model 75 Payscraper and TD-24 crawler tractor at Vandenburg Air Force Base, Santa Maria, Calif. An estimated one million yards of material, mostly loose dune-type sand, has been moved for the new missile base.

"Nothing pulls you through tough scrapes like TORQMATIC DRIVE"

Hit a particularly tough stretch of grading and you'll quickly discover what TORQMATIC DRIVE means in a scraper.

For that's when TORQMATIC's precision-power control pays off. The operator feeds just the power he needs, whether he's humping the blade or bucking his way through a hardpan cut.

It keeps your scrapers on the job, too. For the power-transmitting oil in a TORQMATIC soaks up stresses and strains that could mean trouble. The pay-off: eye-opening records for the fewest repairs, least maintenance and highest availability of any construction equipment around.

It's easy to see what that means to TORQMATIC users. Time after time, they're the outfits that land the biggest, most profitable contracts – simply because they can do better, faster jobs for less.

And remember – TORQMATIC DRIVE is available in most types and makes of construction equipment. For the full story, see your equipment dealer or write:

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TORQMATIC® DRIVES
THE MODERN DRIVE FOR MODERN EQUIPMENT

For more facts, use Request Card at page 18 and circle No. 247

Corps awards contracts for new DEW line stations

The U. S. Army Corps of Engineers will build four new stations in Greenland for the Air Force's Distant Early Warning Line. The new stations will tie in with the existing eastern end of the DEW Line at Cape Dyer on Baffin Island and will extend the line across Greenland at about the latitude of the Arctic Circle.

Two of the new stations will be built on the Greenland ice cap. The other two will be at coastal sites—one on the west coast near the mouth of Itivdleq Fjord, the other on the east coast near Kulusuk.

Contractor for the two coastal stations is Danish Arctic Contractors of Copenhagen, Denmark, for a bid price of $14,404,137. The contract for construction of the two ice-cap stations was awarded to Peter Kiewit Sons' Co., New York City, at a price of $12,720,000.

Each of the new stations will have a single large building surmounted by a radome. This building will house the technical equipment, plus all the support facilities necessary for a complete base. Each station will have troposcatter equipment for communication. A survival building will be erected at each station for use in case of disaster in the main building. A helicopter pad will be built at the west-coast station and a 3,900-foot airstrip at the east-coast station.

The main building at each of the ice-cap stations will be about 15 feet above the snow line. It will be supported on columns equipped with motor-operated jacks to raise or lower the building to maintain the 15-foot clearance as snow accumulates, and to maintain the building in a level operating condition.

Athey appoints manager

Emery E. Hall has been appointed employee relations manager for Athey Products Corp., Chicago. He has been in personnel-industrial relations for the past 15 years.

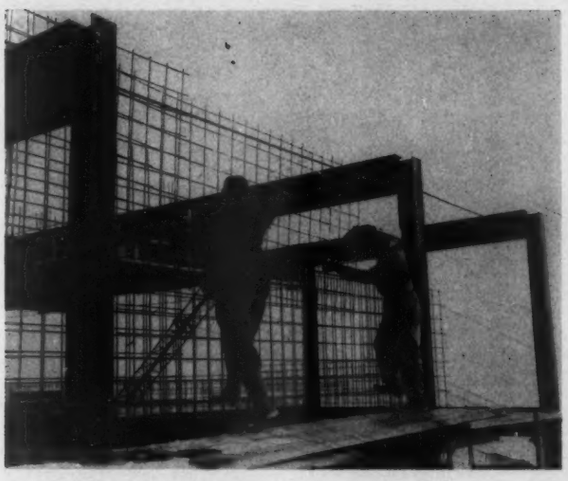
Gravity dams discussed in new textbook

"Uplift in Gravity Dams," by Serge Leliavsky, contains earlier theories and new developments; a survey of the experimental approach and relevant problems; and structural methods for reducing uplift pressure and leakage in dams.

Some of the topics discussed are: elastic deformation of concrete due to the effect of interstitial water pressure and the relevant effective area; piezometer or stand-pipe observations; uplift and evaporation. Other sections present data on graduated concrete; earthen bank; stone facing; external plastering and other types of facings; drainage pipes; drainage efficiency factor; and flat slab. An authors' index and a subject index conclude the text.

The 267-page book is priced at $9.50. It may be obtained from Frederick Ungar Publishing Co., 131 E. 23rd St., New York 10, N. Y.

Steelworkers position the inner line of reinforcement for a 12-inch-thick concrete wall for a Navy radio transmitter house in Cutler, Maine. One of the difficult specifications required all structural and reinforcing steel to be grounded.



Contractor meets tough spex for unusual transmitter house

"Unusual" is the word for a 25,000-square-foot transmitter house being built in Cutler, Maine, for a new Navy radio transmitting station.

Navy specifications required that interior and exterior surfaces of the 25-foot-high walls be flush, with no offsets for structural columns; the walls were to be partially load-bearing, taking some of the load of the 2-way slab roof between columns; and, since large inside areas of the reinforced-concrete building were to be completely shielded with copper lining, all other metal in the structure had to be positively grounded. Then, to relieve the drabness of a solid concrete wall, the designers—a joint venture of Hayden, Harding & Buchanan, Inc., Boston, and James W. Sewall Co., Old Town, Maine—called for vertical ribbing.

Despite the stringent requirements, Consolidated Constructors, Inc., New York City and Portland, Maine, is ahead of schedule on its $1 million contract. In handling the 8×10-foot mats of welded-wire fabric reinforcement, two men position the lower reinforcing and a crane hoists the mats to scaffolding for upper courses of the wall. One welder, working only 15 minutes, can tack a sheet on the side and bottom.

The cross wires of each mat of fabric are welded at all laps between sheets, on all four sides, to meet the requirement for grounding all metal. Where mats cross columns, a weld is required every 4 feet. Brazed "jumpers" between inner and outer lines of fabric were specified at intervals to assure positive connection.

Following directly behind the welders, workers closed up the forms around the two lines of steel reinforcement. Econo-Forms, based on a module of 2×4 feet, were placed two tiers at a time, and the wall was poured in 8-foot lifts. Before the outside forms were closed, 42-inch-wide × 8-foot-long sheets of corrugated cement-asbestos board were positioned to form vertical ribs in the exterior walls. The cement asbestos was fastened against the steel forms with several wire ties, which held it in place until it received the thrust of the plastic concrete. The board was covered with Form-Film, a lacquer-type bond breaker usually used for plywood.

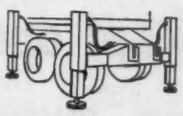
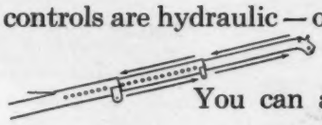
Sections placed were covered with tarpaulins, and gasoline space heaters were used to keep the temperature at 70 degrees for three days and at 50 degrees for the next four days.

All construction joints in the 12-inch-thick wall were keyed for strength and continuity. In each of the vertical and horizontal joints, the lines of welded-wire fabric were "pigtailed" out of the previous pour and continued through the joint without a break.

Spanall adjustable trusses were used to eliminate shoring and underpinning of the roof formwork.

THE END

This is a HYDROCRANE!

It will lift 24,000 pounds. Its outriggers  operate hydraulically and individually — within seconds to keep you level when you work. The controls are hydraulic — oil-smooth. The boom on a Hydrocrane is telescoping.  You can add 12 feet to your reach *on the move*, without stopping! The standard boom can be 24 to 36 feet long, the high lift boom can be 38 to 50 feet long — or even 70 feet long with the jib! The Hydrocrane travels over streets, highways, in plant yards as easily and fast as your pickup trucks. Does it work? It works so well that over 50% of the customers* who have ever bought a Hydrocrane, have bought another!

*Who are they? They're steel erectors, contractors and loggers. They're municipalities, utility companies, precast concrete people. And, there are many more every day. **See your Hydrocrane distributor for a free demonstration,** or write Dept. 15H, Bucyrus-Erie Company, South Milwaukee, Wisconsin.

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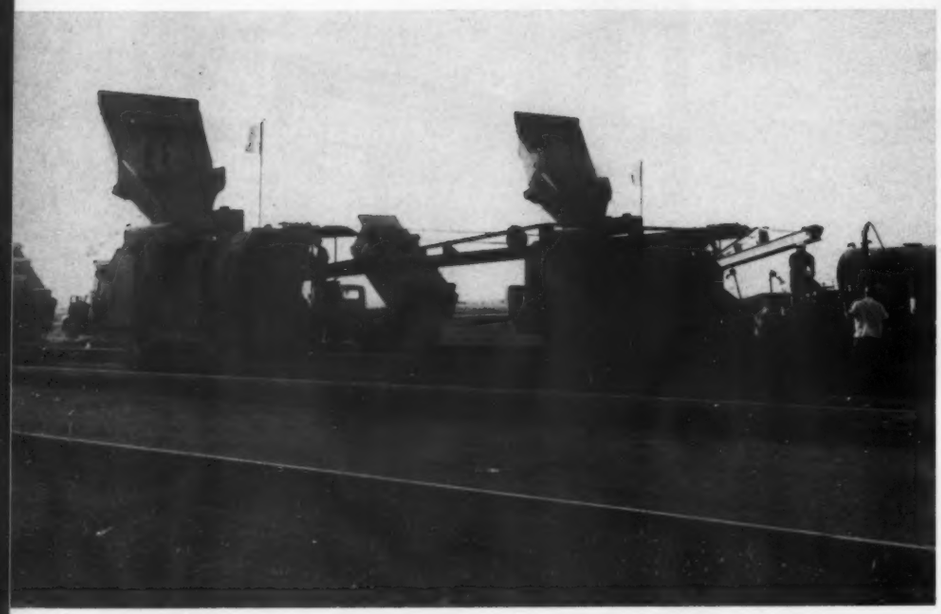
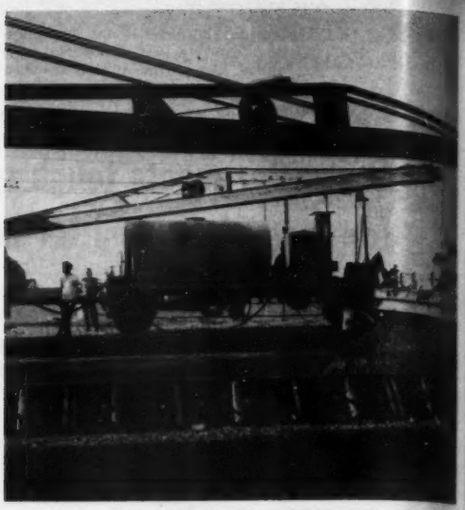


Two Koehring 34-E pavers work on opposite sides of a 25-foot lane being paved for the runway extension at Larson Air Force Base near Moses Lake, Wash. Just behind them, a Blaw-Knox spreader trails ten Stow vibrators through the concrete.

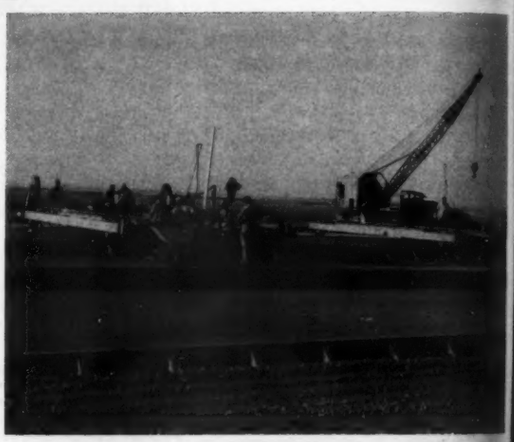


Water for both pavers is supplied by a 3,000-gallon tank on a trailer pulled by one of the 34-E's. A hose line carries water across the lane to the other paver. Also on the trailer is a General Motors diesel generator set that provides power for night lighting.

Air base is kept operative through apron, runway paving

Job, divided into three phases, does not interfere with air traffic; double-paver spread, two longitudinal floats help job move fast

by RALPH MONSON, field editor



By using two Koehring longitudinal floating machines, the contractor made sure that the spread turned out a smooth slab to meet the rigid tolerances. The Insley truck crane is used to transfer equipment to a new lane.

Completing $3.5 million worth of construction on two airport paving projects in a period of just seven months called for precise planning and smooth operation on the part of the contractor. This was particularly important, since the air base had to be in full operation during the construction period.

N. Fiorito Co., Inc., Seattle, Wash., not only succeeded in solving the many problems, but completed practically every phase ahead of schedule.

The first contract, bid at $2,336,752, provided for the extension of the runway at Larson Air Force Base near Moses Lake, Wash., by 3,000 feet at one end and 500 feet at the other, together with accompanying taxiways and allied facilities. The second contract, for $1,173,985, provided for the construction of an operational apron and access taxiways at the base. Both of these contracts, together with several others under way simultaneously, were planned and supervised by the Walla Walla District of the U. S. Army Corps of Engineers.

This Bell Prime Mover is one of a pair that worked from opposite sides of the lane being paved to keep a small supply of concrete available for the finishing machines. The buggies were supplied with concrete by the pavers.

Joint cutting, handled under a subcontract, is done with a Concut gang saw with four blades. Transverse joints are cut to a 3½-inch depth with the diamond-edge blades. Wet burlap is kept on the slabs for the entire curing period.

Keeping the runway continuously open for the use of aircraft required strict adherence to the carefully planned phasing of the work. The 660-foot lengthening at one end was done as Phase I. Then a 2,000-foot section at the far end of the runway was graded and paved as Phase II. Finally, the 1,000-foot closure portion between the existing runway and the new section was built as Phase III. Limited amounts of work could be done simultaneously on two of the phases as long as the work did not interfere with air traffic or clearances.

Phasing was also important on the apron paving, since it was necessary to maintain access to hangars and existing aprons at all times. Careful coordination and cooperation between the Air Force, the Corps of Engineers, and the contractor kept the job running smoothly with a minimum of delays.

Big scrapers do grading

To move the 1.2 million cubic yards of earthwork in the two contracts, Florito used a spread of four Cat DW21 and three Euclid TS-24 scrapers push-loaded by a Cat, Allis-Chalmers, and a Euclid TC-12 tractor. These big scrapers and tractors picked up heaping loads quickly. On the fills, they spread their loads at high speeds, building thin lifts that were easily compacted.

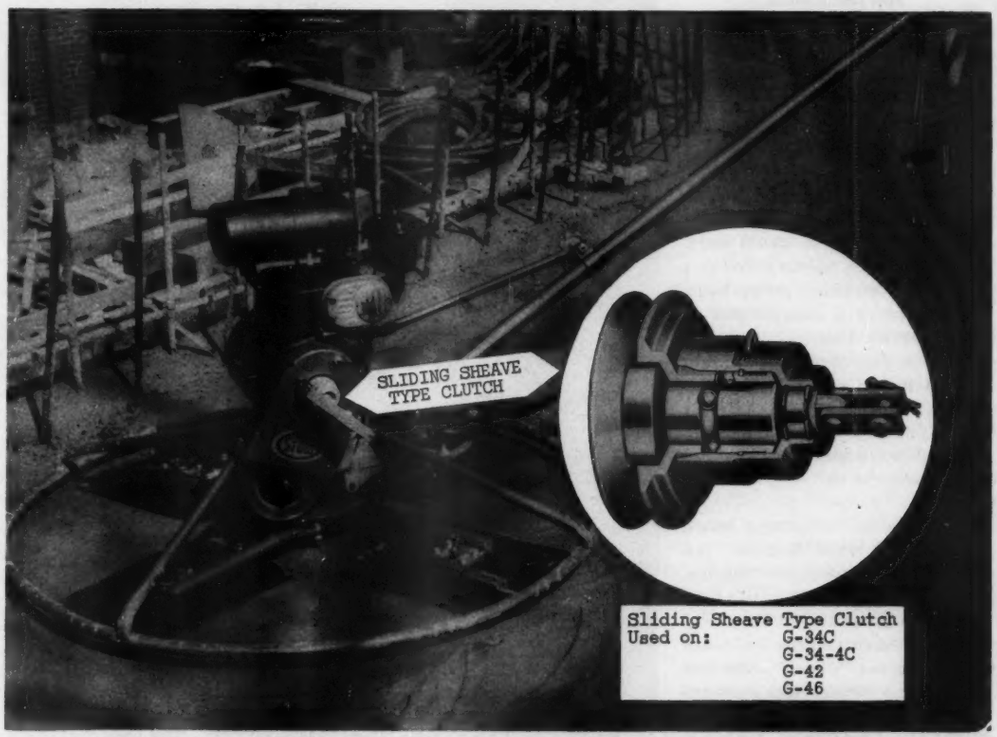
Several types of rollers were on the job to compact the different materials. On one of the fills is a Hyster grid roller pulled by a Cat D7.

Job specifications required at least 95 per cent compaction of the subgrade on both cuts and fills, and Florito used a variety of compaction equipment to obtain these results in the several types of soil. A Hyster grid roller pulled by a D7 tractor did a good job on the fills. On granular materials, where a deep compaction was required, two Essick vibrating rollers were very effective. One of these was pulled by a D4 and the other by a rubber-tire tractor. In other cases,

(*Continued on next page*)

Compaction of granular materials was achieved through the use of an Essick vibrating roller pulled by a Cat D4.

Earthwork for the runway job and the operational apron and taxiway contract was handled by scrapers. This Euclid TS-24 is being pushed to a full load by a Cat D9 with ripper.



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Contractors and builders who have used them tell us that STOW Roto-Trowels do the fastest, most economical job on floating and finishing operations.

One big reason for this top performance is STOW'S exclusive manual clutch control which permits easier engine starts *at any* throttle setting, higher efficiency, less maintenance, faster and smoother finishing operations. The STOW Roto-Trowel is safer too, since the manual clutch automatically stops blade rotation within 1/6 second after the operator releases the handle, without stopping the engine!

Highly maneuverable, the STOW Roto-Trowel features a pitch control on the handle, so operator can change blade pitch easily, while the blades are in motion. Fixed guard ring permits working right up to walls and supports without danger.

STOW Roto-Trowels are available in 9 different models, ranging from 29" to 46" diameter, with 3-blade or 4-blade trowel assembly. For additional information contact your nearest STOW Distributor or write Stow Manufacturing Co., Binghamton, N. Y.

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Dept. E-5, 40 Shear St.
Binghamton, New York

Please send me Concrete Equipment Catalog 580 and name of nearest distributor.

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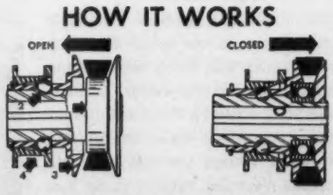
HOW IT WORKS



When the Clutch is disengaged, the sheaves of the pulley are open as shown. The belt rides slack on the outer race of a free running ball bearing.

To start trowel blades, the operator engages the clutch. The sliding sheave which is mounted on ball bearings is carried forward into the closed position. This forces the belt up off the bearing so that it grips the sidewalls of the pulley.

This smooth clutching eliminates grab, results in a slow, even start. With this clutch, belt life is increased since there are no belt stretching problems.

To stop the trowel, the operator lets go of the clutch control. Instantly, the belt pushes the sliding sheave back to the open position and rides free on the idler bearing.

STOW MANUFACTURING CO.
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For more facts, use coupon or Request Card at page 18 and circle No. 249

Base and subbase are produced by this Pioneer crushing-screening setup. At center is the 4×10-foot 3-deck screen. Minus 3-inch goes into a surge hopper. Oversize is split to two conveyors feeding a 4×10-foot 3-deck screen, and jaw and roll crushers.

(Continued from preceding page)

a 50-ton rubber-tire roller pulled by a D9 attained the required compaction.

Base and subbase

A variable depth of subbase, ranging from a minimum of 8 inches to as much as 3 feet, was placed over the compacted subgrade. Four inches of crushed-gravel base course completed the earthwork for the concrete-paving crews.

Base and subbase materials were produced from a gravel pit on the site. An Allis-Chalmers HD-21 and a Cat D9 dozed the pit-run gravel to a trap, where a Pioneer reciprocating feeder delivered a constant flow to the primary feed belt.

The 30-inch primary conveyor brought the pit-run material to an elevated Pioneer 4 × 10-foot 3-deck screen. Minus 3-inch material was taken off of this screen and conveyed directly to surge bins for use as subbase.

Oversize from the primary screen flowed to a 2436 Diamond jaw crusher. The discharge from this primary crusher was split to two belts leading to parallel secondary units. Each of these contained a 4 × 10-foot Pioneer screen, Pioneer 1036 jaw crusher, and Pioneer 4022 triple-roll crusher. The crushed material was recirculated over the secondary screens for final sizing.

Most of the units of this plant were powered by Murphy diesel engines. The plant turned out a daily average of about 1,500 cubic yards of the several types of materials.

The base and subbase materials were trucked to the grade by Mack dump trucks and Cook Bros. dump trucks and bottom-dump trailers. Water was added on the grade by four Mack 4,000-gallon water trucks. The contractor drilled his own well and installed a vertical turbine pump that pumped water directly to the standpipe where the trucks loaded.

As the materials were dumped on the grade, they were spread and mixed by motor graders and compacted by rollers. Only 3½ inches of the planned 4-inch base course was laid initially. The final ½-inch was used for dressing up the base immediately ahead of the paving.

When a section of the base was ready, forms were set for the 25-foot-wide lanes of paving. Since pavement thickness varied from 13 to 20 inches, a variety of forms was required. However, the majority were Blaw-Knox steel forms. Most of the runway and taxiway sections were 14 or 16 inches thick, with edges thickened to 20 inches.

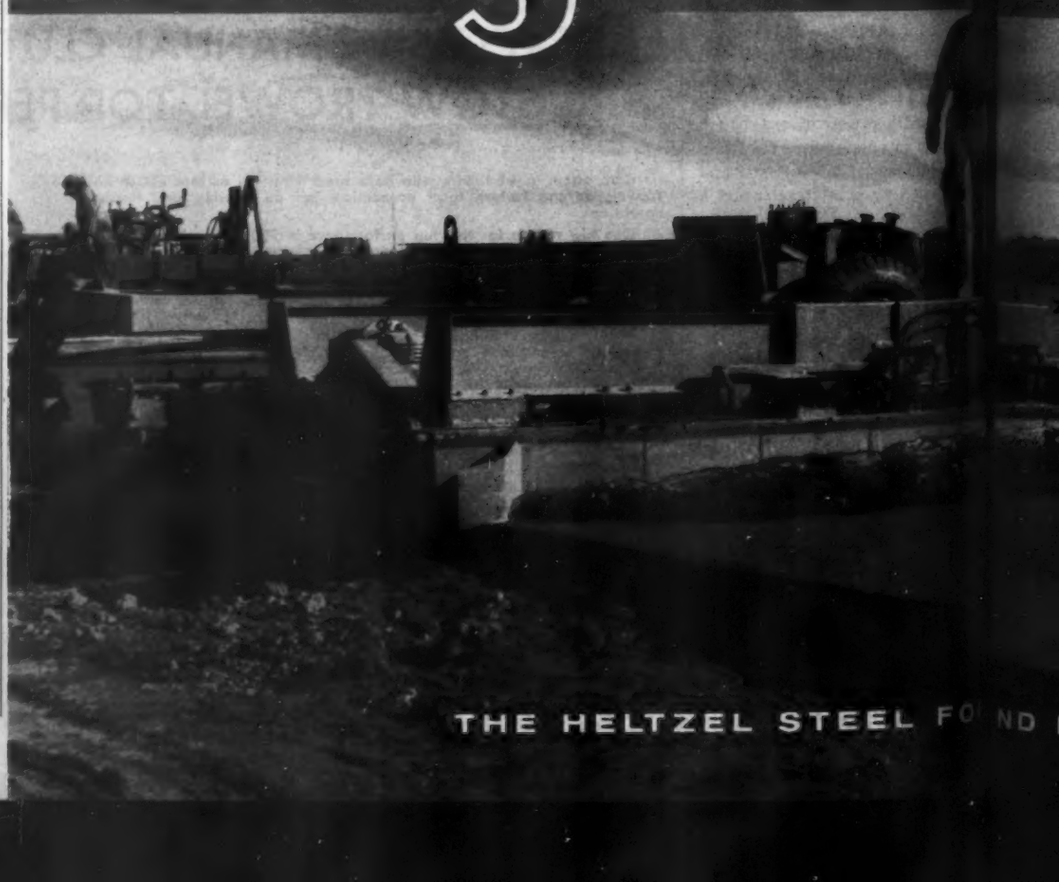
To trim up the grade, a Cat No. 12 motor grader pulled a drag planer riding on the forms. An Austin-Western 3-wheel roller then finished the base.

The paving train was led by two Koehring 34-E pavers, one on each side of the lane being paved. One of the pavers pulled a large trailer carrying a 3,000-gallon water tank. A hose line was strung across the lane between the pavers so that they could use the same water source. The trailer tank was replenished by the Mack tank trucks. Also mounted on the trailer with the water tank was a General Motors diesel generator set that supplied power for night lighting for the entire paving train.

As the pavers laid the concrete on the grade, a Blaw-Knox spreader worked it across the lane section. This spreader carried a trailing attachment with 10 Stow electric vibrators that could be raised and lowered hydraulically. These provided a thorough vibration the full depth of the concrete mass.

Behind the spreader was a new

FLEX-PLANE'S first again



THE HELTZEL STEEL FO ND

Jaeger transverse finishing machine, followed by two Koehring longitudinal floats. These aided in obtaining a smooth finish, and the second rig provided insurance against lost time in case of a breakdown. A contractor-designed belting machine brought up the rear of the finishing train.

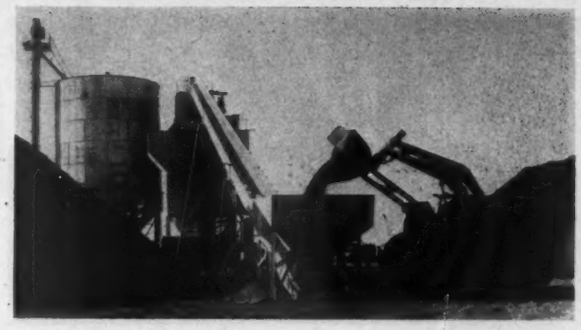
Two Bell Prime Mover concrete buggies, one on each side of the lane, shuttled small amounts of concrete from the pavers back to the finishers or the finishing machines to fill in any deficiencies. An Insley truck crane moved the finishing machines from one lane to another as the work progressed.

Alternate lanes were formed and placed first. Then the forms were removed, smooth tires substituted for the flanged wheels on the finishing machines, and the intervening strips filled in.

As soon as possible, the slabs were covered with wet burlap that was kept wet for the curing period.

Joint sawing was sublet to Charles R. Watts Co., Seattle. Watts used a 4-blade Concut gang saw with diamond-edge blades to cut the 3½-inch-deep transverse joints.

When the concrete pavement was completed, shoulders and overrun areas were paved with bituminous concrete by a subcontractor, McAtee & Heathe, Spokane.



Aggregates are fed from a stockpile to the conveyor leading to the completely automatic Noble plant by a Michigan 175A. The big cement silo and two smaller ones have a capacity of 10,000 barrels.

Make cuts in old apron

Before the apron paving could be started, many cuts were made in the old apron for the installation of fueling facilities. Where the old concrete was to be preserved, the edges of the trench cuts were sawed to a depth of 3 inches with Clipper 36-hp self-propelled saws. After the trench outlines were line-drilled at 3-inch centers with wagon drills, the concrete was broken by a 5-ton ball. This same ball was used to break up sections of old concrete that were to be removed completely.

The broken concrete was loaded by Koehring 801 and 405 shovels and cranes into three Tournarockers that hauled to a waste area. Some of this material was also loaded by a Michigan 175A tractor shovel.

After the fueling facilities were installed, the trenches were backfilled and compacted by Jackson pan-type vibratory compactors. Two Jackson generators each operated two of the 24-inch vibrators on this operation. The hydrant refueling system, including storage tanks above and below ground, was installed under a separate $1,446,184 contract by L. Miller, Inc., Fort Worth, Texas.

Apron paving, which was very similar to the runway paving, was done by the same equipment.

Batch plant

Cement and aggregates for the concrete for both contracts were batched from a Noble automatic plant set up on the base. Concrete aggregates were supplied by Columbia Sand & Gravel Co., Moses Lake, and trucked to the plant in Cook Bros. end-dump trailers pulled by Mack trucks.

Aggregates were reclaimed from the plant stockpiles by a Michigan 175A tractor shovel and a Pettibone Mu!-liken Speedall 250. The tractor shovels fed an inclined belt that led to the distributor over the 3-compartment aggregate bins.

Permanente cement was delivered to the site in truck-trailer transports and stored in three silos that had a combined capacity of 10,000 barrels. A horizontal screw-and-bucket elevator fed the big storage silo, but the two smaller storage tanks were served by a tall vertical cement screw.

Batching was fully automatic, and the weights for each 1.358-cubic-yard

gas-electric finisher-float

Infinite Speed Range, More Power More Versatility—More of Everything in This Revolutionary New Machine

It's the greatest advance in concrete finishing in a decade—Flex-Plane's revolutionary new Gas-Electric Finisher-Float machine that gives you substantially increased power and infinite control of both machine and screed speed, regardless of grade or concrete slump!

This means you can now set both machine and screed speed independently—quickly and easily adjust machine to achieve desired results.

What's more the new Finisher-Float is the most versatile machine marketed today. The finisher frame extends from 12′ to 26′, permitting finishing of everything from full width slabs to ramps and approaches. The finisher section is quickly detached from the float trailer for use on narrower width slab—eliminating the need for a second finisher. Both screeds and float pan are equipped with new extra quick, precision crown change mechanisms.

This great new machine takes the place of a single width finisher, a double width finisher, and a float. It coordinates and combines finishing and floating in one machine with a single operator. A single Flex-Plane combination machine easily maintained pace on the 1958 world's record highway pour. It produces a finish unexcelled in smoothness with a minimum of handwork. See it . . . talk with owners . . . get the facts before you buy and you'll buy Flex-Plane. To get the facts contact the Heltzell-Flex-Plane distributor in your area or write direct.

WARREN, OHIO

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Concrete aggregates, supplied by Columbia Sand & Gravel Co., Moses Lake, are brought to the plant in Cook Bros. end-dump trailers pulled by Macks. The D8 is maintaining the stockpile.

(Continued from preceding page)

batch were recorded by the batcher. No admixtures were added at the plant, but Darex AEA was added with the mixing water at the pavers to give an air content around 5 per cent. Batches were hauled from the plant to the pavers by a fleet of Mack trucks with 8-yard Coast Equipment Co. bodies carrying five batches of concrete per load.

On the runway extension, Neeco Electric Co., Seattle, subcontracted the electrical work. On the apron job, the electrical and mechanical work was subbed by Tide Bay Co., Tacoma. All fuel and lubricants were furnished by Shell Oil Co.

Air-base improvement

With the completion of these contracts, the 300-foot-wide runway was extended 500 feet at the south end and 3,000 feet at the north end. Beyond the south end of the runway, a 150 × 300-foot blast pad was built and surfaced with 2 inches of asphaltic-concrete pavement, and an additional 850 feet of overrun area was graded and given a double bituminous treatment.

At the north end, a 375 × 800-foot concrete warmup pad was built. This was connected to the runway and to the existing taxiway by 3,600 feet of new 75-foot-wide concrete taxiway with 50-foot bituminous shoulders on each side. The overrun area beyond the end of the runway was finished the same as that at the south end. With these extensions, Larson Air Force Base now has a 15,500-foot runway.

The apron-paving contract added a 3,200 × 61-foot extension to the existing operational apron and a 435 × 640-foot extension to the parking apron. In addition, this contract included 4,500 feet of 75-foot-wide apron access taxiways, as well as six big 325 × 200-foot and one 200 × 700-foot "doughnuts" paved with asphaltic concrete for drainage.

Personnel

The two contracts were actually operated as a single project with the

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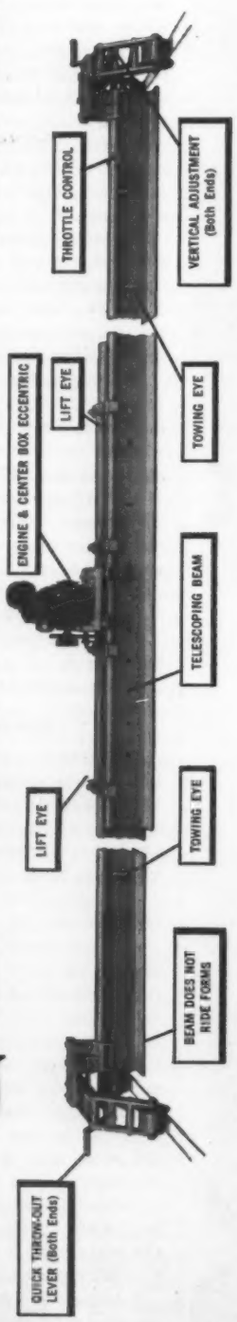

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WHY GO ON LOSING TIME AND MONEY WITH OLD-STYLE SCREEDS? Put a WATSON-CMETCO to work now — you'll be set for practically any size or type of job in the future. Heavy duty Model 2B302 provides 15'6" to 23' beam length; Model 2B303, 22'6" to 36'. Light-duty models for tilt-up slabs and floor slabs provide 10'2" to 15', or 15' to 25' beams. Interchangeable beam sets, special crowned beams available. Also "Build-Your-Own" Economy Screed Kit. Write today for literature; address dept. T-5.

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new CAPACITIES (24 yd. scrapers, 27 yd. wagon)

new POWER (375 hp)

new SPEEDS (to 29.1 mph)

Higher speeds possible with optional equipment.

International 24 cu. yd. 295 Payscraper

Heaped: 31 cu. yd.
Overall length: 44'8".

New high visibility color. Optionally available on all three models in either Federal yellow or International Harvester red.

NEW positive push-type ejection assures quick clean dumping of all materials.

NEW advanced lift frame construction with A-frame-type gooseneck that: 1) increases visibility; 2) distributes weight evenly along cross tube; and 3) protects sheaves of bowl lift system.

NEW full 90° turns with power steering.

NEW 375 hp DT-817 turbocharged 6-cylinder diesel engine. See page 4.

NEW cycle-shortening haul speeds to 26.2 mph plus unmatched maneuverability.

NEW exclusive tapered bowl. See next pages.

NEW high 98" apron opening. See pages 2-3.

NEW automotive comfort and control features ... 16-adjustment bucket seat ... reach-easy controls ... unobstructed vision ... air brakes ... flush deck.

NEW Model 280 cable control unit ... finger-tip control ... fast acting ... high capacity ... simple adjustments ... less maintenance.

See 3-axle models on inside pages...

27 CU. YD. International 495 Paywagon®

Heaped: 40.5 cu. yd.
Payload: 40.5 tons.
Overall length: 50'4½".

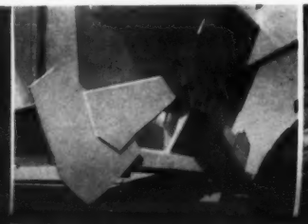
Here in the *27 cu. yd.* International 495 Paywagon is everything that's new and productively *different* in bottom dump design. New 375 hp engine for greater power *per struck yard than any comparable rig.* New higher side and rear end clearance to roll away from any dumped load. New power-opened clamshell doors for positive controlled dumping. New wiper plates put 100% of each load on the fill. New automotive comfort and control features *that* let the operator produce more with less effort. New full 90° turning in either direction. New low design for haul road stability.

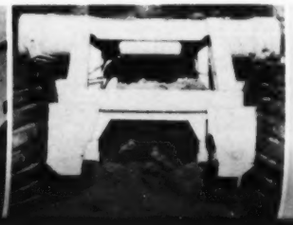
New exclusive power-opened clamshell doors afford positive controlled dumping. Operator spot dumps entire load or windrows material in lifts from a few inches on up. Wiper plates shave all material from doors as they raise. Doors gravity close, eliminating complicated mechanism.

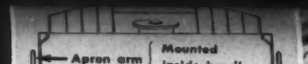
Unmatched 60" rear end dumping clearance lets rig pull fast from fill with no dangling doors dragging on dumped material. Open rear frame lets loader spillage fall through — prevents buildup of "free loading" material.

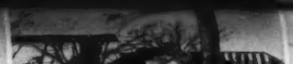
375 HP 495 prime mover gives both 495 Paywagon and 495 Payscraper more hp per struck yard with less gross weight per hp than any similar sized earth mover. Speeds to 29.1 mph. 10'8¼" wheel base. Full 180° non-stop turns can be made within 39'11¾".

NEW
high speeds
big capacities
fast dumping









high speeds

big capacities

fast dumping

unmatched control

This new International 495 Payscraper boils a heaped load into a 24 cu. yd. bowl in less time than any other three-axle scraper in its class and hauls it at speeds up to 29.1 mph. The trailing unit, common to the 295 Payscraper, offers this unmatched combination of features that cut dirt costs: big 131-in. cutting width . . . tapered bowl permits efficient ejection of all materials with equal ease . . . positive forced ejection . . . improved lift frame construction . . . full 90° turns . . . more hp per struck yard than all competitive units . . . wheels and bowl leveling adjustment . . . advanced sheave bearing design . . . and custom designed cable control unit.

Exclusive tapered bowl design: 1) permits scraper and pusher to work inside cut for best traction, less wear on tires, and tracks; 2) causes dirt to boil toward center, reducing side spillage; 3) extra wide bowl bottom provides wider spread, speeds dirt breakaway and lets scraper work cuts against banks.

Positive forced ejection dumps all materials — even wet or frozen clay and gumbo — cleanly and quickly. Six large ball bearing mounted rollers center and guide ejector gate, have 240-hour lube intervals.

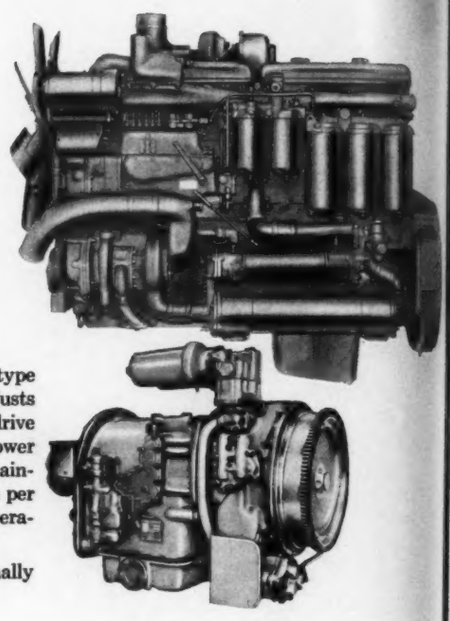
Gaping 98" apron opening plus no bowl cross member permits sure ejection of all materials. Apron opened by exclusive, rear-controlled mechanical linkage. Apron is synchronized with ejector for positive controlled spreading.

24 CU. YD. International 495 Payscraper

Heaped: 31 cu. yd.
Overall length: 50'6¼".

New Turbocharged International DT-817 powers all three giant earthmovers

- Develops 375 hp @ 2100 rpm
- Direct push-button, 24-volt starting
- Positive valve rotators — increase valve life
- Aluminum alloy pistons for fast heat dissipation
- Wet sleeve construction provides additional cooling
- Fully counterbalanced crankshaft for smooth engine performance
- Dual intake and exhaust valves for peak engine efficiency
- Twin plunger injection pump precision meters fuel
- Hang down type replaceable filters for maximum fuel and oil filtering efficiency
- Tri-metal crankshaft bearings for long trouble-free service



Both prime movers are available with 4-speed, planetary type torque converter power shift transmission. It automatically adjusts output torque and speed to fit load requirements. Torqmatic drive makes more power available over the entire range; applies power smoothly and continuously, resulting in less wheel slippage; maintains high tractive effort; and cuts the number of gear shifts per cycle, letting operator concentrate on loading and spreading operations.

A constant mesh 9-speed manual shift transmission is optionally available on both prime movers.

See your International Construction Equipment Distributor for complete information on these NEW International Earthmovers

International® *Construction Equipment*

International Harvester Co. • 180 N. Michigan Ave., • Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheeler Tractors . . . Self-Propelled Scrapers and Bottom Dump Wagons . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

Auxiliary lighting for concrete finishers is provided by this Master generator and the floodlights. In the background, a big truck trailer is supplying water for the joint-cutting operation.

STEEL PLATES FOR A WATER TANK are lifted into place for welders at Fort Bliss, just north of El Paso, Texas, by a 30-ton Lorain Moto-Crane Model MC-530 with 70-foot boom and 25-foot jib. The 100-foot-diameter 28-foot-high tank, with a 1,500,000-gallon capacity, will supply water for the off-base Capehart housing project for noncommissioned officers.

same men, machines, and supervisory staff headed by project manager Joe Dale. Others on the staff were paving superintendent George Picardo, grading superintendent Red Gilleland, crushing superintendent Bert McAllister, carpenter superintendent John Nord, and form superintendent Jerry Cake.

The busy Corps of Engineers office at Larson AFB operates under the direction of resident engineer Thomas J. Mendiola. The assistant resident engineer is Richard B. Kramer; the soils engineer, John Roof; and the chief paving inspector, Jack Johnson. Work at this base is under the jurisdiction of the U. S. Army Engineer District, Walla Walla, Corps of Engineers, of which Col. Paul H. Symbol is district engineer and Oliver A. Lewis is chief of the construction division. THE END

Four-language dictionary of building construction

A "Dictionary of Building Construction" in four languages contains nearly 8,500 terms used in the building trade by contractors, architects, tradesmen, and office personnel. Entries are arranged on an English alphabetical basis, and the corresponding terms in French, Dutch, and German are given horizontally across the page. The book has been compiled and arranged by C. J. Van Mansum.

Priced at $15.75, the book is available from D. Van Nostrand Co., Inc., 120 Alexander St., Princeton, N. J.

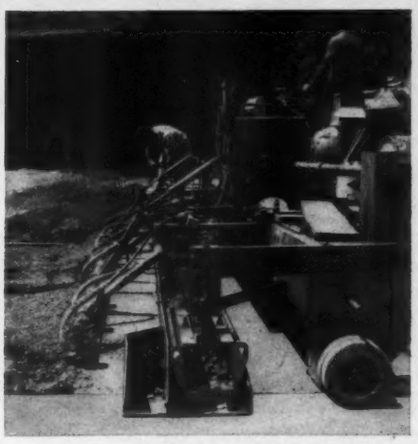
New PCA safety film

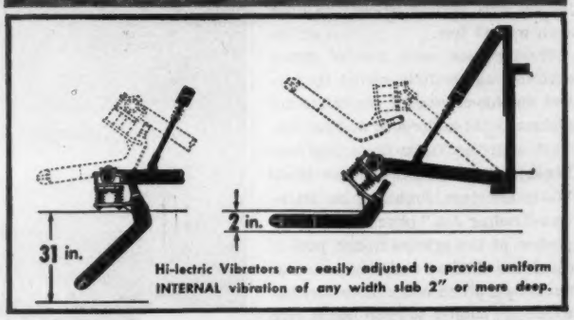
A 16-mm sound and color motion picture on safe job performance in portland-cement manufacturing plants has been released by the Portland Cement Association. Entitled "Growing Pains," the 33-minute dramatization emphasizes the importance of a mature attitude toward safety among plant workers.

The safety value of teamwork, observance of rules and instructions, discipline, and due regard for consequences are brought out in the story. The theme is applicable to any situation requiring safety awareness.

The film is available from the PCA, 33 W. Grand Ave., Chicago 10, Ill.

To Cut Job Costs - Put MAGINNISS FULL SLAB VIBRATORS - ON YOUR FINISHING MACHINE





Hi-lectric Vibrators are easily adjusted to provide uniform INTERNAL vibration of any width slab 2" or more deep.

Increase production 20%

Hundreds of paving contractors are eliminating the second pass of the finisher—and often the need of a spreader—by using MAGINNISS Hi-lectric Vibrators on their finishing machines. Operating completely immersed in the concrete, Hi-lectric vibrators speed distribution, leave surface semi-finished, increase production up to 20%. You can bid lower—and IMPROVE quality of concrete—by using MAGINNISS Hi-lectric internal vibration.

Easy mounting

Quickly mounted on any finisher or spreader. No auxiliary carriage required. All attachment parts are furnished complete.

Minimum labor

The finishing machine operator controls all positioning of vibrator, on and off, and the vibration speed to suit consistency of concrete and other job conditions. Vibrators are raised and lowered by double-acting hydraulic cylinders powered by the hydraulic system of the finishing machine.

Eliminate honeycomb throughout slab

Angle positioning of vibrators below surface of slab obtains most efficient results possible—assures a UNIFORM homogeneous mixture of aggregate and mortar from base to surface. MAGINNISS Hi-lectrics easily handle the stiffest concrete mixes.

Packed with power—built to last

Hi-lectric Vibrators have only TWO moving parts. No brushes, commutators, gears, flexible shafts, nor complicated air or fluid drive mechanisms to require costly repair or replacement. Because the induction motor is located in the vibrator head, it is cooled by the surrounding concrete.

WRITE FOR COMPLETE INFORMATION—or call your nearest MAGINNISS Distributor. He's listed under "Contractors Equipment" in 85 principal cities.

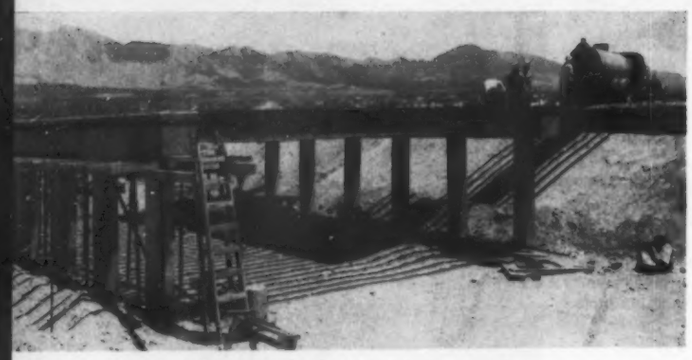
Find your nearest distributor in the 'Yellow Pages'

Maginniss HI-LECTRIC VIBRATORS

MAGINNISS Power Tool Company
Dept. CE-59, 154 Dietl Avenue, Mansfield, Ohio

For more facts, use Request Card at page 18 and circle No. 254

Shoring system for bridg



One of the 39 bridges built on an 11-mile section of interstate highway in Texas is a slab-type bridge with spans standardized at 25 and 30 feet. Workmen are completing forming for the deck, using bar joists and Plyform.

Shoring and forming the decks of 39 bridges on an 11-mile section of interstate highway near El Paso, Texas, presented some unusual problems to the contractor because of the danger of flash floods in the waterways being bridged. This meant that the waterway channels had to be kept as clear as possible during the construction period.

Robert E. McKee, General Contractor, Inc., El Paso, handled the problem by using shoring that could span from pier to pier without intermediate supports. On flat slab structures with spans of 25 and 30 feet, Southwestern Steel Producers Co. bar joists supported the deck forms and the 14-inch-deep slab. Dixie self-shoring pans did a similar job on pan girders where the deck span was 40 feet.

Shoring was only one of many problems successfully solved by McKee on this section of the interstate highway built under a $2 million contract with the Texas State Highway Department. (See "Contractor Beats Water-Shortage Problems on Highway Grading Job," page 76.)

Most of the bridges in the project carry the divided highway over watercourses which are usually dry, but which are subject to flash floods. One of the structures is a continuous concrete girder overpass with spans of 50, 65, 65, and 50 feet. This bridge was cast in place with conventional forming and shoring, since there was no problem of carrying drainage or traffic under it during the construction period.

Designs standardized

The remaining structures are of two types, both of which have been standardized by the Texas highway department. One of these is a continuous flat slab structure of three or four spans. End spans are 25 feet long and center spans 30 feet, making the total bridge length 80 or 110 feet. In all cases, the slabs are 14 inches thick.

The other type is of pan-girder design with a span of 40 feet. The longitudinal girders, spaced at 3-foot centers, are 2.75 feet deep and widen from 8¼ inches at the bottom to about 12 inches where they join the 3½-inch-thick deck slab. Structures carrying through-lane traffic do not have curbs; they are crown-width structures, the over-all dimension being the roadway width plus 2 feet. The outside post on each side is a continuation of the usual roadway crown and is designed to receive a rail post of concrete.

Piers for both the slab and pan-girder bridges are similar. They consist either of precast, prestressed-concrete piles or circular concrete columns with cast-in-place caps.

Drill for piles

Pilot holes for the prestressed-concrete piles were drilled to depths ranging from just a few feet to as much as 30 feet by three Calweld

FREIGHT MOVES ACROSS DEEP ARCTIC SNOW ON ELECTRIC WHEEL "SNO-TRAIN" BY R. G. LeTOURNEAU, INC.

Heavy cargo . . . powdery snow . . . hundr
miles from solid ground — these are co
conquered by the Army's "Sno-train," bu
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Electric Wheels . . . sixteen or sixty
prime mover . . . make hauling possible wh
other cargo vehicle has ever penetrated.
on huge, low-pressure tires — ten feet hi
four feet wide — the Electric Wheels pro

STACKER lifts . . . carries . . . stacks 30-ton loads. Electric Wheels give infinite range of power control from dead stop to full speed for smooth, fast traveling, and tremendous torque for muddy yards.

TRANSPORTER traverses Pakistan desert with oilfield equipment. Regenerative electric braking automatically holds machine and 30-ton load at pre-set speed . . . has no friction surfaces or wearing parts.

LANDING CRAFT RETRIEVER
stranded in surf. Electric Wheel
foot tires assure tremendous tr
flotation needed to operate thru
sand. Simple fingertip control

eeps channels clear during work on spans

drilling rigs using 24-inch buckets. One of these rigs, owned by McKee, was mounted on a Link-Belt Speeder Model 71 crane. The other two were truck-mounted drills on Ford trucks rented from George F. Casey Co., East Los Angeles, Calif.

The drills usually worked in sandy material, which in some cases was so unstable that it would not stand. Where the fine sand tended to flow into the hole as it was drilled, the crews used a drilling mud of clay, Aquagel, and water mixed on the job site in a Smith 2-cubic-yard transit mixer. Where necessary, the holes were partially filled with this mud while the drilling was carried down.

A second type of standardized bridge used by the department along the 11-mile stretch is the pan-girder bridge with 40-foot span. Pans are supported at the ends on angles attached to the pier caps with Superior cone ties. The adjustable steel shores are for safety purposes.

When the holes were finished, the drilling rigs set the prestressed-concrete piles in place for the driving. The 26,000 linear feet of prestressed-concrete piles was supplied by Atlas Structural Concrete, Inc., El Paso. The piles were supplied in 14 and 16-inch-square sizes and in lengths ranging from 20 to 38 feet.

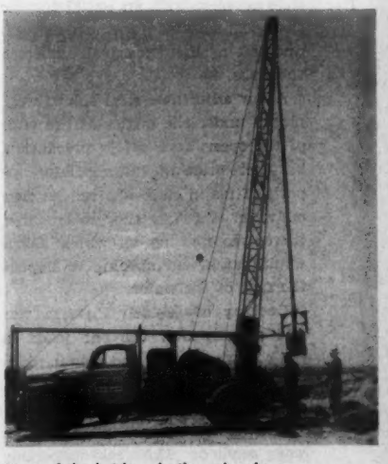
A Koehring 304 truck crane with telescoping leads and a Vulcan No. 1 hammer drove the piles the 12 to 16 inches usually required to attain the required bearing. A Bros high-speed steam generator supplied steam for the driver.

Columns cast in Sonotubes

Where a good caliche conglomerate was available at footing grade, the piers are founded on spread concrete footings. A truck crane and clamshell bucket excavated the holes, which were carried down into the conglomerate to provide a keying action. The 5-foot-square footings were cast in place directly from transit mixers.

The pier columns were formed with 24-inch-diameter Sonotubes. The prefabricated reinforcing cage was set in place by a crane, and concrete was placed by crane and bucket. The Sonotubes were stripped the day after placement, and curing with wet blankets continued for four days.

Pier caps for either type of pier were formed and cast in place, the caps for the pan-girder spans being 2 feet wide. Caps for the pile bents were 2.25 feet square, while those on



Most of the bridges built under the contract are founded on precast, prestressed-concrete piles, and to get the piles to the desired depth, the contractor drilled pilot holes. Here, men of George F. Casey Co. are drilling the holes with a Calweld rig.

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Electric Wheels
Work as a Team
To Out-Perform
Other Drive Systems

For the last five years, the Electric Wheel developed by R. G. LeTourneau, Inc., has been used to power many types of machines . . . some of them built for jobs never before considered feasible. Where conventional machines have failed, the tremendous power of *numerous* driving wheels . . . four, forty or even more . . . has provided the cumulative traction needed to carry heavy loads cross-country.

This capability has been successfully applied in mobile machines for industry wherever tremendous tractive power is required. It is now available for hauling, digging, pushing and other BIG construction jobs. Because the Electric Wheel is its own self-contained power package, design is not limited by power-transmission systems. These wheels are *prime movers*, for use wherever and in whatever numbers needed, whether a four-wheel tractor, a six-wheel scraper or a fifty-wheel ore train.

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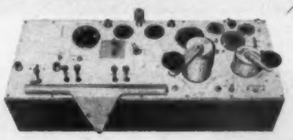
Earthmoving machines with all-wheel electric drive — one of them shown below — are now being built for the BIG jobs in construction and mining. For information please call or write 2395 South MacArthur, Longview, Texas.



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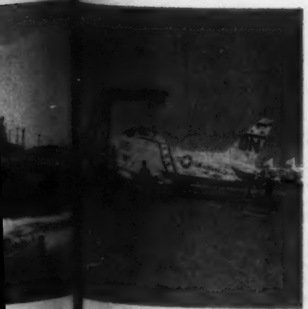

for Navy carriers handles plane
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planes. All work functions
by electric motors which give
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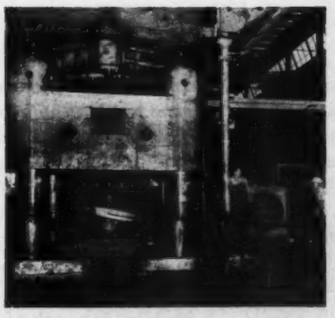

FORGING PRESS shapes part for Electric Drive machine in one of our plants. All components that go into equipment are built by R. G. LeTourneau, Inc., to assure dependable, trouble-free performance.

NEW EARTHMOVING EQUIPMENT. L-28-Ton Digging Scraper is latest of new Electric Drive earthmoving equipment now working. Write for information on exciting new machines for your BIG jobs.

For more facts, use Request Card at page 18 and circle No. 255

Cement and aggregate are proportioned to the transit mixers on the project by this Noble plant. The Michigan 125A tractor shovel feeds the boot of the vertical bucket elevator leading to the 3-compartment bin. The cement silo has a 350-barrel capacity.

(*Continued from preceding page*)

the columns measured 2.25×3 feet. Cap forms consisted of 4×8 ledgers supported on Acrow adjustable steel shores with 4×4 joists supporting the soffits and side forms. The standard side-form panels of ⅝-inch Plyform backed by 2 × 4's were tied with Superior hardware. On several of the higher piers, a set of tubular-steel scaffold towers was placed on the ground with the adjustable steel shores resting on the scaffolding.

Concrete for piers and columns was delivered to the bridge site from the central batching plant in Rex and Smith 6-yard transit mixers mounted on International trucks. A Bay City Cranemobile with 80-foot boom placed the concrete, using a 1-yard bucket.

Floods endanger shoring

While the danger of flash floods practically prohibited the use of the more ordinary types of shoring for the deck forms, McKee actually transformed this potential handicap to an advantage. The bar-joist shores, supported only at the piers, were quickly placed and easily stripped, and they could be re-used indefinitely.

To support the ends of the bar joists, 6×6 or 6×4 angles were bolted to the sides of the pier caps by means of Superior cone ties and ¾-inch bolts. Southwestern Steel Producers Co. 147 bar joists were used on the 25-foot spans and Ceco 167 joists on the 30-foot spans. Both were spaced at 16-inch centers. The bar joists were supplied with an initial camber that compensated for the deflection and left a slight positive camber in the slabs.

A few adjustable steel shores were placed under the angles at the ends of the spans as a safety precaution, but there were no intermediate supports. Thus in case of a sudden flow of water through the watercourse, there was nothing on which debris would catch and nothing to impede the flow of the water.

Decking of ⅝-inch Plyform was laid directly over the bar joists in full 4×8-foot sheets and held in place with a minimum of small nails.

Where a span of 40 feet was desirable, the deep pan-girder design was applied. The self-supporting pans for these bridges were supplied by Dixie Form & Steel Co., San Antonio, Texas. Like the bar joists, these pans were supported on angles bolted to the pier caps.

Reinforcing prefabricated

While the deck forms for a span were being built, the reinforcing crews prefabricated the entire mat of reinforcing steel for the span on any convenient level area. All the steel for a span was unloaded from a truck right where the mat was to be fabricated. The workmen merely had to move it into place. When the entire mat was ready, a crane picked it up and set it in place on the forms.

Some 2.65 million pounds of reinforcing steel for the structures was supplied by Darbyshire Steel Co., El Paso.

Plant produces concrete

The 16,000 cubic yards of concrete in the structures was batched from a Noble plant set up near the center of the job. Aggregates were delivered by truck from commercial suppliers and stockpiled at the plant site. A Michigan 125A tractor shovel delivered the aggregates from the stockpiles to a hopper feeding the boot of the bucket conveyor, which led to the elevated

"Our Ford F-800's, pulling 20-ton payloads, give us mighty good service!"

says R. Dillard Teer, Vice President
Nello L. Teer Co., Durham, N. Carolina

"We operate about 115 Ford Trucks ranging in size from ½-ton pickups to Tilt Cab Tandem tractors. We believe in carefully fitting the truck to the job to be done and usually stay within the manufacturer's recommended ratings. We make an exception to this rule with our Ford F-800's, pulling 20-ton loads in aluminum trailer dumps to our quarry and crushing setup at Durham, North Carolina. These units are carrying the maximum legal limit and give us mighty good service!

"We haven't traded any trucks in about 6 years. It just happens that our company has been growing so rapidly that when we buy a new truck, usually an F-800, I put it under one of our trailer dumps. Then I'll take the old truck, lengthen the chassis, and make a grease outfit or a water wagon out of it. I would say out of over a hundred Ford units in the past 7 or 8 years, we have gotten rid of only a dozen altogether—and some of these were wrecked or burned.

"Another reason we use Fords is that this business is rough on trucks, so parts availability is very important. Our experience over the years with Ford as compared to Ford competitors has been definitely in favor of Ford on parts."

bins. Cement was delivered by truck transport and stored in the 350-barrel built-in cement silo of the plant.

Two-yard batches were manually proportioned and discharged into a fleet of 6-yard Smith and Rex transit mixers mounted on International trucks.

In this desert area, water was one of the problems. The contractor drilled several wells, one of which was located near the batch plant. A vertical-turbine Berkeley pump raised water from the well to a 185,000-gallon ground tank lined with 6-mil Visqueen plastic waterproofing. A small pump drafted from the ground tank and pumped the water to a 3,500-gallon tank-trailer at the plant site. Another pump delivered the water to the transit mixers. These several pumps were arranged in sequence so that a supply of water was always available.

Electric power for the operation of the booster pumps and the batch plant was supplied by a pair of 50-kw Caterpillar diesel generator plants, one of which served only as a standby.

A Bay City Cranemobile places concrete in one of the pier caps. A tubular scaffold platform below lends stability to the adjustable steel shores that support the 4×8 ledgers on which the 4×4 bottom joists of the form rest. Columns of these piers were cast in Sonotubes.

As the transit mixers delivered the mix to the bridge sites, it was bucketed into place by the Bay City crane using a 1-yard bucket. Viber electric vibrators powered by Kohler generators assisted in working the mix down around the steel. Deck slabs were struck off and finished by hand. The finished surfaces were immediately given a coat of Hunt Process curing compound to prevent checking of the surface in the hot sun. The completed decks were covered with blankets and cured with water.

Personnel

Superintendent of the project for Robert E. McKee was Byron Kirksey. J. R. Nelson and R. S. Phillips were engineers; A. B. Palmore, Sr., was carpenter foreman; and F. J. McClain, concrete foreman.

The Texas State Highway Department was represented on the project by senior resident engineer L. E. Wood, assisted by chief inspector Albert R. Gschwind and senior engineering assistant Herbert K. Brasseur. The work was done under the supervision of the El Paso District with E. W. Mars as district engineer. The Texas state highway engineer is D. C. Greer. THE END

Koehring of California moves to new offices

Executive, engineering, and accounting personnel of Koehring Co. of California have moved into a new office building directly across the street from the manufacturing facilities in Stockton, Calif. Located at 2002 Country Club Blvd., the building also houses the West Coast sales headquarters of the C. S. Johnson Co. Both companies are divisions of Koehring Co., Milwaukee.

Champion moves quarters

The St. Louis, Mo., firm of Champion Mfg. Co. has moved to a 30,000-square-foot facility at 3700 Forest Park Blvd. The company, which manufactures construction machinery, was formerly located at 2028 Washington Ave.

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FORD TRUCKS COST LESS

'59 Ford Pickups beat average mileage of other leading makes by 25.2% in Economy Showdown U.S.A.

Here at last is certified proof of the differences in gas mileage between six-cylinder pickups . . . evidence that you can use in your operation.

It was compiled by America's foremost independent automotive research firm after testing 1959 six-cylinder, ½-ton pickups of the six leading makes. All trucks were bought from dealers—just as you would.

The tests paralleled every kind of driving – high speeds and low, open highways and city traffic, even door-to-door delivery. And in every test, '59 Ford Sixes delivered more miles per gallon than any other make. Here are the actual percentages:

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42.6% better mileage than make "D"
31.1% better mileage than make "I"
25.2% better mileage than make "C"
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9.6% better mileage than make "G"

Taken together, Ford got 25.2% more miles per gallon than the average of all other leading pickups!

What's the secret of Ford's economy? First, of all pickup sixes, only the Ford Six has modern Short Stroke design which reduces friction and requires less fuel. Second, to this modern engine, Ford has added a new economy carburetor to meter fuel more precisely in both high- and low-speed ranges.

See your Ford Dealer for the full report of Economy Showdown U.S.A. and get the whole story firsthand.

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Now! During Dividend Days at your Ford Dealer's...Go *FORD*-ward for Savings

←For more facts, circle No. 256

Contractor beats water-shortage problems on highway grading job

This well is one of four sources of water for grading and base operations, and for the concrete batch plant supplying concrete for structures on this highway job in the arid area north of El Paso. Water is raised from the well by a Western vertical-turbine pump driven by a Waukesha engine.

Pumping, storing, transporting, and using some 90 million gallons of water constituted one of the major increments of work for Robert E. McKee, General Contractor, Inc., El Paso, Texas, in the grading of a 10.882-mile section of interstate highway in a near-desert area north of that city.

McKee's $2 million-plus contract with the Texas State Highway Department included 1.8 million cubic yards of excavation, together with 39 bridges and other related work. (See "Shoring System for Bridges Keeps Channels Clear During Work on Spans," page 72.)

The divided highway, which will be paved with bituminous concrete under a separate contract, begins at the Texas-New Mexico line and extends southerly to meet the Mesa Highway (U. S. 80) in El Paso. At its northerly terminus, the work joins a similar project under construction in New Mexico. Since there is no suitable intermediate access to the new right-of-way, the entire section in both states must be completed before any of it can be opened for use.

A lower bench, on which the old alignment of highway U.S. 80 is located, is an area of irrigated farmland heavily built up with residential, commercial, and industrial buildings. The new route is on an entirely new alignment higher up the bank of the sloping valley of the Rio Grande River. Here, the land is essentially a desert of sand, sage, and cactus.

Tough going in loose sand

No buildings and little valuable farmland were taken in acquiring the new right-of-way. Yet some engineering and construction problems were encountered. Getting water for soil compaction and dust control was one. The alignment crossed all drainage channels leading from the higher land on one side to the river on the other. This made necessary the construction of a large number of drainage structures.

Although the new alignment is, at most, only a few miles from the existing highway, there are few crossroads. This made access to and over the right-of-way one of the contractor's first problems. Survey parties and supervisory personnel on the site at the start of construction had to depend on 4-wheel-drive Jeeps or similar rigs to carry them through the soft, loose sand. Haul roads and access roads had to be surfaced be-

HEIL-TEC dump trailers

Exclusive design cuts dead weight...lets you haul up to 4,000 lb more payload

Exclusive design of TEC frameless dump trailers—engineered for maximum strength and stability with minimum tare weight—saves 1,000 to 2,000 lb per unit compared to conventional frame-type trailers. TEC frameless dump trailers can be furnished in long lengths to permit forward location of lower fifth wheel on tractor, and also obtain long extreme axle spacing as required in many states. *Payload can be increased as much as 4,000 lb* in certain states . . . and even more where longer axle spacing is desirable.

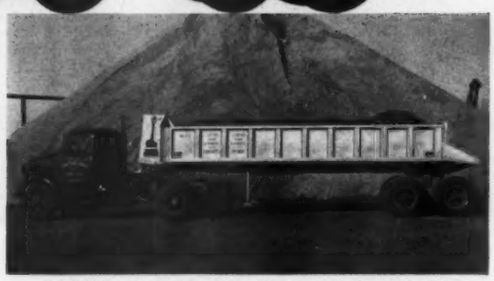
Aluminum boosts payload

With aluminum construction, you can haul an extra 2,400 to 3,000-lb payload. Weight-saving HY-TEC and HY-SPILL design and aluminum construction actually can soon pay for itself in increased income.

TEC builds single axle and tandem semi-trailers for use with either single axle or tandem tractors. Single axle trailers are available in body lengths from 16 to 28 ft, and tandem axle units in lengths from 20 to 34 ft.

TEC design gives you on-the-job advantages

- Exclusive HY-SPILL design permits dumping into high hoppers, paving and spreading machines.
- Body can be raised or lowered while moving, with better stability than any other hauling unit.
- Trailer can be dumped while jackknifed, speeds dumping and turn-around in tight places.
- Excellent balance and maximum stability let you haul and dump safely and efficiently on rugged job sites and off-highway conditions . . . anywhere your truck can go.



HY-SPILL dump trailers increase the versatility of your hauling rig. *Exclusive, patented design* holds front tandem wheels on ground during dumping, provides 38 to 40-in. spill height from end of body floor to ground. Clearance is ample for high stockpiling, dumping into above-ground hoppers and paving and spreading machines. Aluminum construction (illustrated) saves up to 3,000 lb, pays dividends every trip.

Fleet of HY-TEC dump trailers operated by a large Midwestern sand and gravel producer. First two units in foreground are aluminum.

TEC Division THE HEIL CO. DUMP BODIES and HOISTS

TEC Division, 1285 West 70th Street, Cleveland 2, Ohio

For more facts, use Request Card at page 18 and circle No. 257

Wells, pumps, storage tanks, and prewatered excavation are contractor's answers to getting the job done

Two Allis-Chalmers HD-20's work in tandem to load a Euclid S-18 scraper. Loading time averaged about a cubic yard per second, even under difficult conditions.

fare they could be used by ordinary truck and automobile traffic.

Drill wells for water

Surrounded by desert and needing 90 million gallons of water, the contractor had his second problem clearly defined. An exploratory well showed that there were limited quantities of ground water that could be developed with wells ranging around 200 feet deep. McKee immediately began the drilling of four wells, distributed over the length of the job, to develop this supply. The wells were fitted with Berkeley and Western vertical-turbine pumps powered by Waukesha butane-burning engines.

The best of these wells produced a maximum of about 650 gpm, but this was not enough to meet peak demands. It was necessary to provide some storage so that the pumps could maintain the supply by pumping during the night or other off-peak periods.

The contractor handled this by scooping out a ground tank beside each of the wells. The typical tank was about 35×80 feet and had a capacity of around 185,000 gallons. A larger tank was built at one site to accommodate the concrete batch plant.

Since a simple ground tank would not hold water in the loose desert sand, McKee waterproofed the tanks with a lining of Visqueen plastic film 6 mils in thickness. The black Visqueen was supplied in 30×100-foot sheets that were cemented together to form a continuous lining.

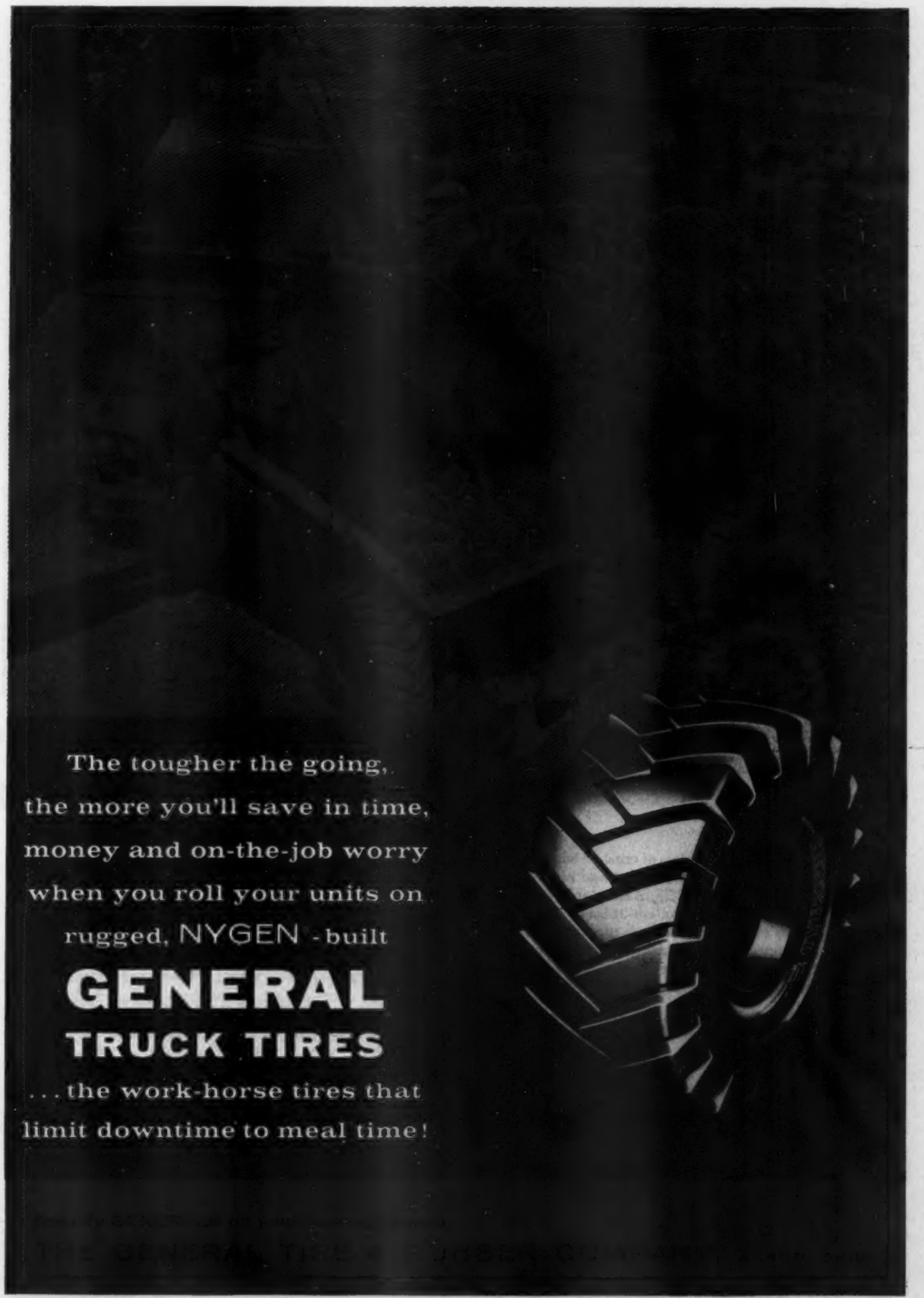
Excavation prewatered

Cuts and fills on the job ranged to a maximum of 25 and 20 feet, respectively, with the material predominantly dry sand and an occasional caliche deposit. Adding and incorporating enough water for optimum compaction moisture was the big problem.

Taking advantage of the manipulation of the materials that would occur during the handling operations, McKee chose to apply the water to the cuts ahead of the excavation. This proved to be very satisfactory and economical.

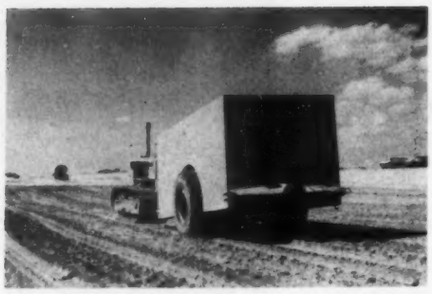
To move the water from the ground tanks to the cuts, six Carver 4-inch pumps, powered by butane-burning

(*Continued on next page*)



For more facts, use Request Card at page 18 and circle No. 258

An International WD-9 tractor pulls an Essick vibratory roller to compact a sand fill. In some instances, three of these rollers were pulled in tandem by a single tractor on the sand embankments.



Compaction of an embankment is handled by a Grace 50-ton rubber-tire roller pulled by a Cat D7. The material, spread in thin layers for easy compaction, has been prewatered in the cuts so that water and earth are well mixed by the time scrapers unload.

(*Continued from preceding page*)

engines, were set up to draft from the ground tanks and pump to loading stands where tank trucks were loaded. Thirteen 3,000-gallon tank trucks shuttled in a steady stream from the pump stands to the cuts and the haul roads, wetting down the soil and controlling the dust.

No attempt was made to water the cuts to any great depth. The water trucks simply kept working through the cuts ahead of the scraper spreads, wetting down a thin lift at a time. As the scrapers loaded and then dumped the material, the water was thoroughly incorporated with the soil so that compaction equipment could follow immediately behind the scrapers.

Several earthwork spreads

To handle the 1.8 million cubic yards of earthwork, the general contractor joined forces with Borsberry Construction Co., Inc., El Paso. Equipment spreads of both firms were intermingled along the right-of-way. At times there were as many as 12 motor scrapers, about an equal number of big tractors, and 6 motor graders at work, in addition to the compaction and watering equipment.

Double push-loading of the scrapers by two push-tractors in tandem was the usual operation, and the soil boiled into the bowls at a rate of at least a cubic yard per second. One pair of Allis-Chalmers HD-20 tractors did a lion's share of the pushing. Both of these tractors were equipped with rear push-blocks and front push-plates. As one of the Euclid S-18 or Caterpillar DW21 scrapers got its load, the rear pusher backed away and immediately started pushing another scraper. The lead pusher gave the scraper a final boost to take it out of the cut in the highest possible gear, then swung back to join the second pusher.

A pair of Caterpillar D8 tractors worked with one of the other spreads. These rigs were not equipped with rear push-blocks, but one of them had a rear-mounted Ateco ripper. This tractor usually took the lead position as the second one pushed against the heavy ripper frame. In addition to the Euclid S-18's and Cat DW21's the several spreads included some Euclid 6-wheel scrapers, an International 2-T-75, and a Cat DW15.

The material from one of the cuts was to be wasted, and there was no need to water it. But loading this loose dry sand proved to be a job that only the scrapers with 2-wheel tractors could handle successfully. The S-18's, DW21's and the 2-T-75 worked this large cut with the aid of the two D8 pushers. These rigs really proved their powers of flotation and their ability to work in the loose material by operating in the disposal area without the assistance of a dozer.

The material was dumped over a reasonably wide area, but it had to

To prepare new crushers for a hard life, Wasco County, Oregon, hardfaces rollers with Victor alloy rod. The rollers showed no discernible wear after crushing 3100 tons of extremely hard and abrasive basalt.

Lifesaver for new or used equipment **VICTOR Hardfacing Alloys**

Wasco County, Oregon, uses lots of crushed basalt. This rock crushes readily, yet is extremely hard and highly abrasive, consequently tough on rollers. So, as standard practice, Supt. Wayne Weeks hardfaces all rollers in brand new crushers, before ever they crush a single basalt rock. He reports hardfacing of new equipment prevents excessive wear of surface material, thus maintaining roller size during the work hardening period.

On this new crusher, he used 200 lbs. of Victor #0 semi-automatic wire, size 7/64", to hardface roller faces, and 50 lbs. of tube Victorite coated for finish work around the roller edges. Longer crushing life will quickly pay for the rod.

You, too, can save money and extend the life of equipment subjected to abrasion, impact and heat. Simply make it standard practice to hardface both new and worn equipment with Victor alloy rods. Complete line of 27 different hardfacing rods assures you a right rod for every hardfacing need. Full range of sizes for both acetylene and electric AC and DC applications, either hand, automatic or semi-automatic. Order a supply from your Victor dealer TODAY.

FREE Victor Hardfacing Manual shows you right rod to use and how to apply it. Write us NOW for your copy.

VICTOR for welding

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VICTOR EQUIPMENT COMPANY 42

ALLOY ROD AND METAL DIVISION

13808 E. Imperial Highway, Norwalk, Calif. • Wakita, Oklahoma

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$30,000,000 Sutton Dam takes shape near Sutton, W.Va., where Gulf fuels and lubricants help keep this Army Engineers' flood control project on schedule. Joint contractors, under supervision of Mr. J. H. Hay are: Arundel of Baltimore, Md.; L. E. Dixon of San Gabriel, Calif.; and Hunkin-Conkey of Cleveland, Ohio. Over 380,000 cubic yards of earth and rock will have been moved, and more than 610,000 yards of concrete placed when the dam is completed late in 1959. Pictured above are J. H. Hay, (right), General Superintendent of the Sutton Dam project, and John Hindsley, Gulf Sales Engineer, at the dam site. On-the-job help is part of the service you get from Gulf.

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It's proved on every type of job ▸▸▸

Gulf products and service help you trim costs and beat deadlines . . .

Since every contractor is in business to make money, it will pay you to see how Gulf makes things run better cost-wise and operation-wise . . . through clean-burning fuels, clean-working lubricants, prompt deliveries and top-calibre service.

You'll save money on maintenance costs when you switch to Gulf fuels and lubricants—because they help you keep your equipment working longer between overhauls. They prevent harmful engine deposits, excessive wear, and clogged fuel injectors.

You'll save time when you go Gulf—not only by reducing mechanical delays and unnecessary downtime—but because you'll be sure of prompt delivery from a dependable source of supply. 1500 strategically located warehouses in 32 states provide an unfailing supply of the Gulf fuels and lubricants you need.

You'll be sure of on-the-job help from your Gulf Sales Engineer, who is backed up by 1300 Gulf scientists and engineers at Gulf Research Center. Your operation will run more smoothly, more profitably.

GULF MAKES THINGS RUN BETTER!

"Penn-Can Highway" contractor slashes downtime on 300 pieces of heavy equipment, using Gulf fuels and lubricants. S. J. Groves & Sons Company of Syracuse, New York, built all grade separations and approaches and did all landscaping for 16 miles of highway and 15 miles of access roads on "Penn-Can Highway" in upper New York State. Photo shows work on the Oswego Boulevard section in Syracuse, where 250 buildings were removed in order to form a connecting link to the highway.

Gulf services an unusual "floating service station" rigged up by Heavy Constructors of Miami and Fort Lauderdale, contractors on the new 36th Street Causeway in Miami—a $3,500,000 job. This barge stores and transports 5100 gallons of Gulf Dieselect fuel, 1650 gallons of Good Gulf gasoline, 8000 gallons of fresh water and 400 barrels of cement . . . for the pouring of 20,000 cubic feet of concrete instream to form piers for the causeway. Key to the success of the operation: delivery of materials to shore site.

Conditions wet. Schedule met. Plowing through the muddy roadbed of U.S. Route 301, Dickerson, Inc., of Monroe, N.C., turned up a lot of evidence that Gulf makes things run better. Under unusually wet conditions they moved over 1,250,000 yards of unclassified material. They sank more than 16,000 feet of underground drainage pipe, in addition to conventional culverts. They finished on time. Their earth moving units were operated on Gulf fuels and lubricants.

Gulf teams up with the Blankenships of Charlotte, North Carolina, contractors for the grading, drainage and bridge building on a 4.6 mile section of U.S. Route 29. The Blankenships credit Gulf fuels and lubricants with helping them set a schedule-beating pace on this contract. Left to right: W. C. Ritchie, Gulf Sales Representative; Roy G. Burkhalter, Sr., Gulf Sales Representative; Banks Massey, General Superintendent, Blankenship Brothers; Benjamin M. Blankenship, Partner; Mike Blankenship (son of Ben) on machine.

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GULF

be built up to form a diversion dike to guide water toward one of the bridges. The scrapers hit the dump at maximum speed and under full power. Spreading their loads very thin, the rigs emptied their bowls with sufficient reserve speed and power to easily get them back to the haul road. Three or four scrapers with two push-tractors and no other supporting equipment moved the 110,000 cubic yards of sand from this cut in a very short time.

Rollers provide compaction

On the embankments, a variety of rollers compacted the material as it was spread by the scrapers. Vibro-Plus and Essick vibratory rollers were used effectively in areas where the material was practically clean sand. As many as three of the Essick rollers were pulled in tandem by an Allis-Chalmers HD-5 tractor.

At least four pairs of Tampo and Gebhard sheepsfoot rollers pulled by Cat D7 and D8 tractors provided the basic compaction on most of the fills. In all cases, a final proof rolling by Bros and Grace 50-ton pneumatic rollers completed the compaction operation. Because of the prewatering in the borrows, it was seldom necessary to add water on the fills. Water was added simply to wet the surface and compensate for evaporation. Little or no manipulation of the fill material was required.

One rig on the job really doubled in brass. This was a new Allis-Chalmers HD-21 tractor equipped with Tracto-Ripper. Whenever there was caliche or other cemented material to rip, this machine handled the job. At other times it pushed scrapers or handled two or more of these jobs simultaneously.

Two service crews using two well equipped lube trucks serviced the several spreads daily. The service crews started work three hours after the other crews went to work. During working hours they lubricated motor graders, rolling equipment, and other rigs that could stop without delaying production. At lunch time, they serviced the push-tractors. The scrapers were serviced each evening after the regular shift was through for the day.

Personnel

The entire project was supervised for McKee by superintendent Byron Kirksey. Earthwork superintendent was Phil Parker. Engineers on the staff were Bob Phillips, John Nelson, Warren Hill, and Rex Cracknell.

The district engineer of the El Paso District of the Texas State Highway Department is E. W. Mars. Senior resident engineer on the project was L. E. Wood, who was assisted by Albert R. Gschwind and Herbert E. Brasseur. The Texas state highway engineer is D. C. Greer.

THE END

Allocation of $3 million for the survey and construction of public land roads has been announced by the Bureau of Public Roads. Idaho receives the biggest amount, $1 million. Work will be done in seven other states.

A FILL AREA at the site of an industrial construction project in Bayonne, N. J., is leveled out by a Model 12 Payloader tractor shovel. Mohawk Constructors, Inc., Linden, N. J., also used the tractor shovel to grade the fill area, load out stockpile material, and slope banks on firewall installation around large fuel storage tanks.

Cleveland 110 speeds turnpike drainage improvement

Clevelands have dug many miles of trenches for U. S. highways

Versatile, efficient Cleveland Trenchers have dug thousands of miles of trenches for the construction and improvement of U. S. highways—from secondary roads to big modern turnpikes and thruways.

Clevelands, like the one shown at right cutting underdrain trench adjacent to a catch basin at a turnpike interchange, are widely used to cut trench required for water drainage along U. S. roads. They're also used for restoration of farm drainage systems along rights-of-way ... for relocating intersected gas, water and oil pipelines ... for installing highway lighting cable and conduit ... and for fast accurate cutting of shallow trench required in highway rewidening.

The Job... installing drain tile along a 20-mile section of turnpike to improve surface drainage.

The Digging... in hard shale under 10 inches of tough aggregate in the shoulder of the pike.

The Record... the Cleveland boosted trench production 300%—to 2,400 feet per day. No other type of machine previously had been able to get more than 600 feet per day.

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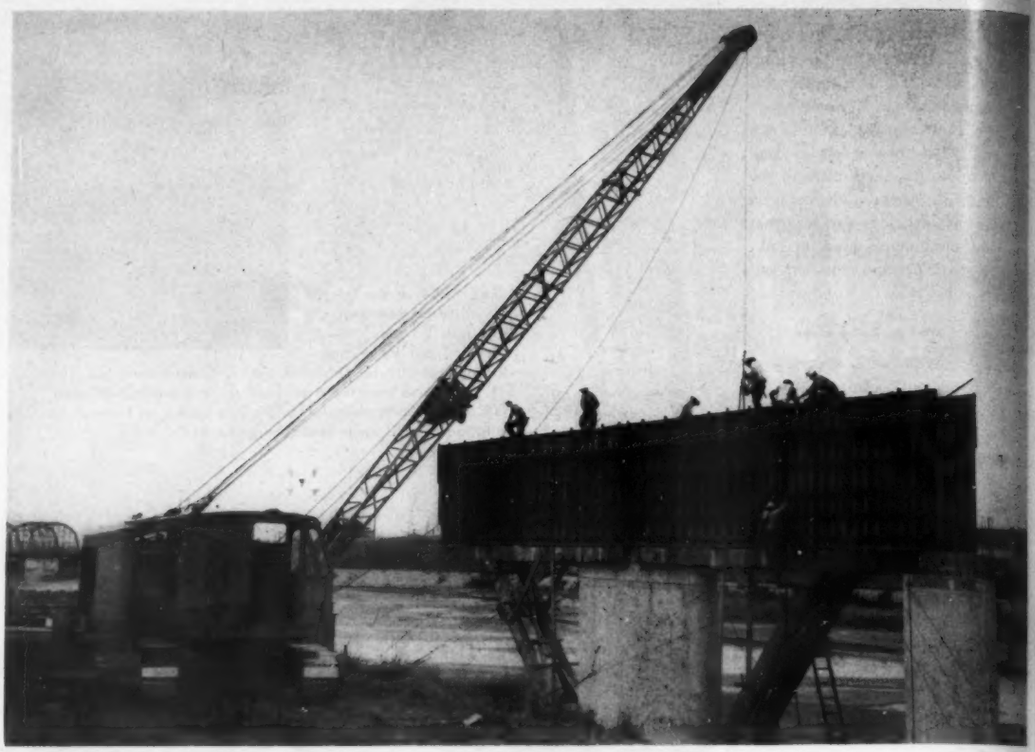
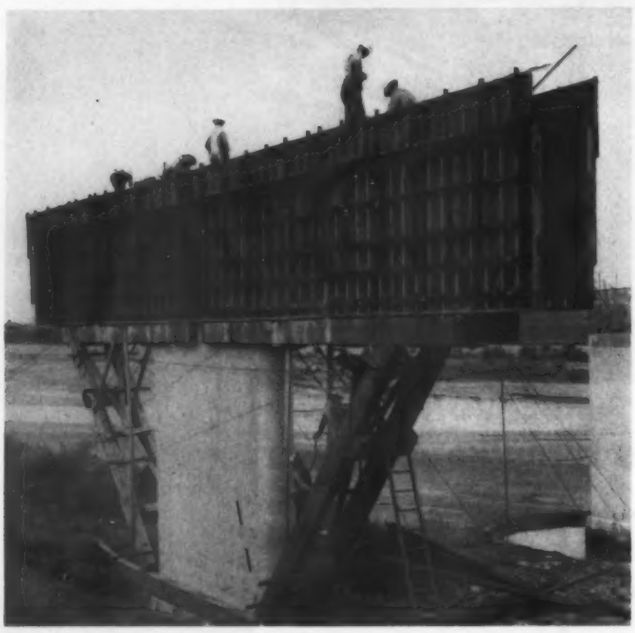


A Koehring 304 crane handles reinforcing for workmen on a cap form for one of the piers of the double bridge across a road, railroad, and the North Canadian River in Oklahoma City. Forming of the box-shaped stems did a lot to cut labor costs; a side panel and end panels of ¾-inch plywood were assembled on a jig, reinforcing was set, a fourth panel added, and the entire form raised into place by a crane.

New forming method, cap-form support cuts work time on bridge piers

by BILL ALLEN
field editor



A unique arrangement of timbers supports the 17-foot overhang of the cap and eliminates the need for driving 8 piles. Horizontal timbers are held up by steel saddles that straddle the top of the stem. On the outer end, horizontal timbers are supported by diagonal bracing members which, in turn, are supported by horizontal members resting on a ledge at the base of the stem. Cables hold diagonal members in place.

A workman tightens the horizontal cable that hugs two sets of diagonal bracing together. His foot rests on a pair of cables that also help support the diagonal members. The upper end of this pair of cables is tied to dowel steel in the top of the stem; the lower end is secured to a cross timber that bears on the diagonal members. Turnbuckles tighten these cables.

A new method of forming helped a contractor to set a record pace for building the piers on a double bridge in Oklahoma City, Okla.

By building the form boxes in advance, complete with the reinforcing steel, E. E. Barber Construction Co., Fort Smith, Ark., was able to complete the major portion of the 11,000 cubic yards of concrete in the substructure during the first two and a half months of construction. Good planning and experienced crews also played a large part in the high production.

During those two and a half months, piers sprang out of the river bottom like mushrooms. Of the total of 31 T-shaped piers on the two bridges, Barber completed 8; got all but the cap on 16; poured 3 footings; and drove 20 sheet-pile cofferdams. And all this was done with 3 cranes and a crew of 12 men. Even though Barber paid overtime to the men, who worked 6 and 7 days a week, labor costs were reduced one-third below what was anticipated.

The reduced labor costs were due, in part, to the efficient method of forming the box-shaped stems to the piers. In this method, form panels are placed on an elevated working platform to build three sides of the box. The open box lies on its side, making it accessible to men setting the wire reinforcing steel in the form. After the top panel has been set in place, snap ties are run through the completed form. The ties not only hold the form together, but they also hold the cage of reinforcing steel in place. The box is then lifted from the working platform and either stockpiled or used immediately to form one of the two lifts in the pier stem.

An unusual method of supporting the forms for the pier caps also contributed to reduced labor costs. Rather than using timber piles to support the overhang on the T-shaped piers, Barber figured out a system of diagonal timber bracing that rested on the pier stem.

Skewy bridges

The layout on the two bridges kept engineers working overtime. The 1,331-foot east bridge curves off in one direction; the 1,399-foot west bridge curves off in the opposite direction. And all of the piers are skewed off in various directions. In addition to the sweeping horizontal curve, each bridge contains three vertical curves and a superelevated deck. The continuous rolled-girder spans of each bridge carry a 42-foot roadway.

The designers of the complicated bridges are Hudgins, Thompson, Ball & Associates, Oklahoma City. This firm's design was shaped into concrete and steel by E. E. Barber Construction Co. for the price of $1.4 million.

The bridges are expected to be finished this month, making it possible for Interstate 40 traffic to and from Tinker Field to cross over Reno Avenue, the St. Louis-San Francisco tracks, and the North Canadian River. The traffic will flow uninterrupted into an interchange connect-

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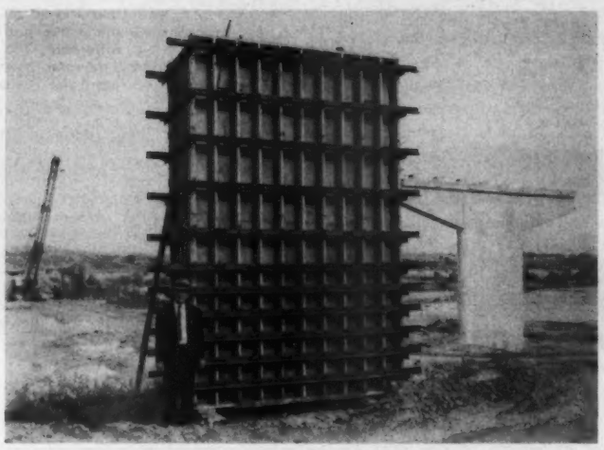

E. E. Barber, president of E. E. Barber Construction Co., Fort Smith, Ark., stands in front of a 10×4×16-foot box form for the lower lift of a pier. Reinforcing is inside the form. The 3×3 steel angle wales are on varying centers. Plywood form panels are backed by 2×6 joists on 1-foot centers.

CLYDES MAKE BIG POUR AT THROGS NECK

On the Queens anchorage of the multi-million dollar Throgs Neck Bridge, New York City, a joint venture of J. Rich Steers, Inc. and Frederick Snare Corp., a Clyde hoist and derrick team up to place most of the concrete in the huge caisson.

The Clyde derrick positioned on the wall of the coffer-dam, has a 150 foot boom that enables it to cover almost the entire area of the 146 x 226 foot box.

A 21,000 pound line pull three drum Clyde hoist and an independent swinger provide ample power to handle the concrete bucket smoothly, rapidly and with complete safety.

The nation's leading contractors rely upon the unmatched value of Clyde equipment to keep materials moving on jobs that demand tight building schedules. Whether you have little yardage or a big pour; and occasional lift or a high speed rehandling program, it pays to take advantage of Clyde equipment.

It takes a lot of features to add up to a superior quality, work-hungry hoist and Clyde has all of them. All steel bed and side frames that provide exceptional ruggedness without excessive weight. Large diameter brakes and clutches that assure positive load control. Anti-friction bearings throughout for less maintenance and power consumption . . . these are but a few of the many advanced engineering details that have contributed to make Clyde hoists the very finest in the field for over 60 years. Clyde products are available in a wide range of sizes, styles and capacities to suit your particular material handling needs.

Write now, for a new Bulletin 34A that tells you why Quality is Always Foremost in Clyde Hoists.

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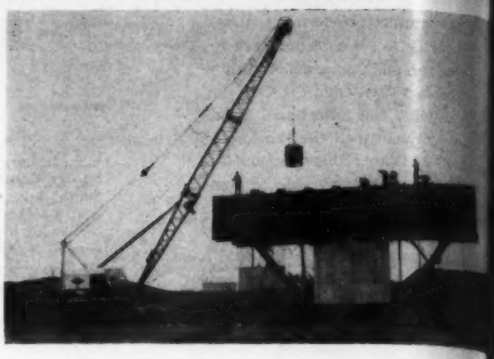
◄ A Lima 703 SC 50-ton crane lowers a pump into position beside the river cofferdam. The pump will be used to dewater the cofferdam, filled by a recent rise in the river.

The Lima 703 buckets ready-mix concrete to the pier cap. Two Insley 1-yard buckets are used; one is filled while the other is dumped by the crane. The crane's boom is equipped with a device, made by Safety Boom Corp., Little Rock, which protects the operator if the boom contacts a power line. ►



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ing with the eastern bypass around Oklahoma City.

Special jig assists forming

The key to the construction of the prefabricated forms for the pier stems is a special work platform, or jig, where the forms are assembled. Basically, the jig consists of two pipe sawhorses supporting an open timber frame. On this frame a side panel for the form is placed. The frame is about five feet above the ground.

Equipment on bridge job

- Koehring 304 ¾-yard crane
- Link-Belt L-S 98 1-yard crane
- Lima SC3 50-ton crane
- International TD-9 tractor with Drott 4-in-1 loader
- McKiernan-Terry DE-30 diesel hammer
- Universal snap ties
- Insley concrete buckets
- Robberson Steel I-beams

This space permits men to secure snap ties while working under the frame.

The jig also has a convenient arrangement for assisting a crane in lifting the completed form into an upright position. The timber frame is hinged to one of the sawhorses to permit its being tilted up along with the box form. After the frame swings the form into an upright position, a crane does the lifting. The heaviest of the forms with the steel inside weighs about nine tons and measures 4×17×24 feet.

Wood forms have steel wales

The form is built from four prefabricated panels—one for each side of the box. The panels are built of ¾-inch plywood backed by vertical 2×6's on 1-foot centers. Bolted to the 2×6's are 3×3 angle wales on varying centers. For convenience in securing the snap ties, the wedge assemblies are welded to the wales. On the upper "round-nosed" lift of the stem, steel forms are used for headers.

Prefab work goes fast

The first step in assembling the form is to place a side panel and two end panels on the jig. The side panel lies flat on its back. The end panels,

BIG PERFORMANCE

Hauling tremendous 230-ton transformers over soft roadways demands equipment capable of tremendous performance. Such performance is found in this new super Mack tractor recently purchased by Gerosa Haulage and Warehouse Corporation, New York.

Gerosa, noted for taking on the biggest, toughest and most unusual hauling jobs, for years has successfully teamed up with Macks . . . and found them equal to any job tackled. Mack transmissions, famous for built-in quality and stamina, stand up to the most demanding jobs. And for unsurpassed pulling power under the most adverse conditions there is nothing comparable to the Mack-built Balanced Bogie with exclusive Power Divider.

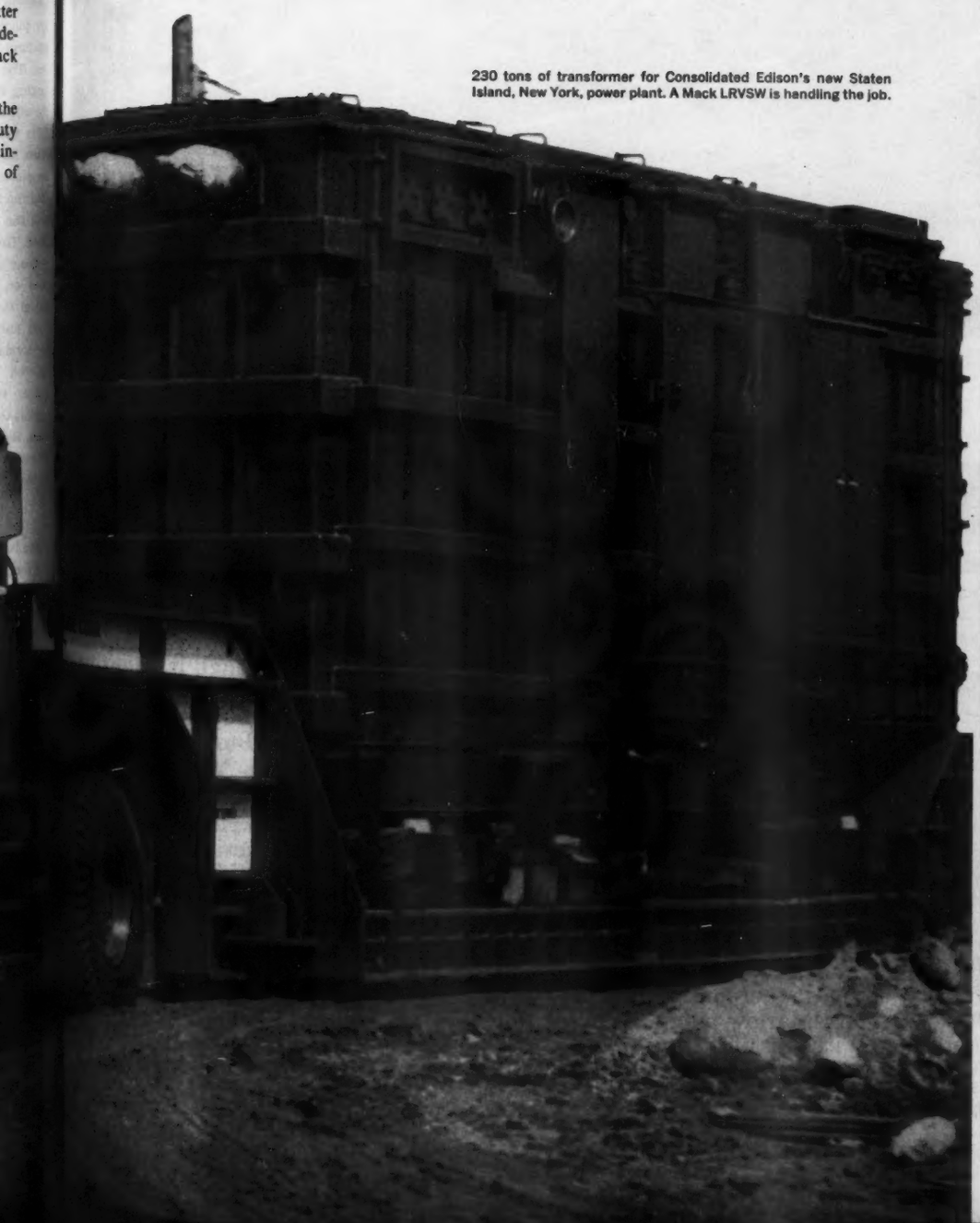
Big dramatic job—every-day bread-and-butter job . . . whenever it must be done efficiently, dependably, with the least downtime, there's a Mack that will best fill the bill.

See your Mack branch or distributor for all the facts on the most complete line of heavy-duty trucks available today. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

MACK
FIRST NAME FOR
TRUCKS

E. E. Barber, second from the right, checks on the performance of a TD-9 tractor with Drott 4-in-1 bucket he has just purchased. The operator, sent by the dealer, will stay on the job until one of Barber's men learns the operation of the rig.

CEON THE *BIG* JOBS



230 tons of transformer for Consolidated Edison's new Staten Island, New York, power plant. A Mack LRVSW is handling the job.

or headers, are upright. In this position, men can conveniently tie in the steel. After the reinforcing steel is placed, the top panel is lowered into position to close the box.

Universal snap ties are then run through the box to tie it together, as well as hold the steel cage in position. Then the box is tilted upward and lifted with a crane.

The work is done fast. To strip, build, and set a form in place takes a crew of six men approximately six hours.

Unique support for cap forms

To support the cap forms of the T-shaped piers, Stan Barber, the superintendent, devised an unusual arrangement of timbers bearing on the pier stem itself. The scheme eliminated the need for driving eight falsework piles.

The support under one of the wings of the "T," starting at the bottom and going up, consists of two timbers, straddling the pier, and resting on a ledge between lifts. Two diagonal timbers stem out to meet two horizontal timbers at the base of the form. These two horizontal timbers are supported at one end by steel saddles hung over the top of the pier stem and at the other end by the diagonal timbers. Resting on the horizontal timbers is a wedge-shaped steel soffit to form the cantilevered section of the cap. All timbers are 8×16's. The larger caps run to 80 feet in length and contain 80 yards of concrete.

The diagonal bracing is held in place by two sets of cables. One horizontal set of cables hugs together the two sets of diagonal timbers. Another set of cables pulls from the dowel steel at the top of the stem to a wale bearing on the diagonal members.

Personnel

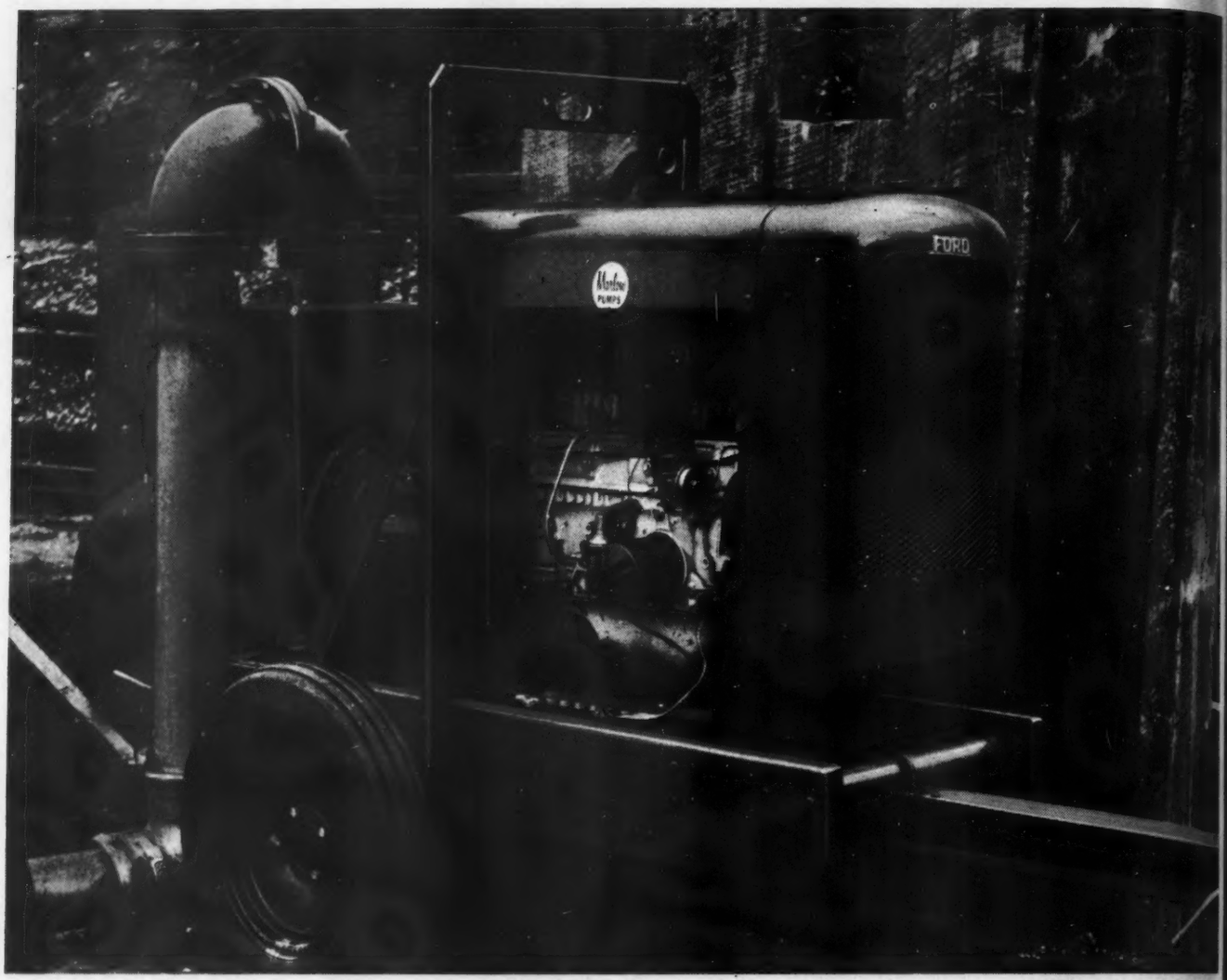
Stan Barber, the 28-year-old superintendent, thought up the new method of forming and designed the support for the caps. His father, E. E. Barber, president of the company, supervised the driving of the sheet-pile cofferdams.

J. M. Copeland is the resident engineer for the state highway department. The bridge inspectors are Atley Cannon and Loyde Warren.

THE END

Stan Barber, left, and his father, E. E. Barber, discuss plans for the day's work. E. E. Barber personally supervised the driving of the cofferdams.

For more facts, circle No. 263



This 6E4, Ford engine-driven Marlow Contractors Pump, sold by Foundation Equipment Co., was used 8 hours a day to keep the hole dry. The unit has a capacity of 90,000 G.P.H.

Marlow Pumps Help Keep $25,000,000 Yonkers Sewer Project On Schedule!

The City of Yonkers, N. Y., has a new $25,000,000 sewer system being built by several contractors. The work includes a new pipeline, plus additional treatment capacity. The project, made necessary by the pressure of a continuous population increase, will relieve the present system and strained sewage treatment facilities.

A local firm is one of the contractors on the project. Their part of the program calls for the installation of approximately 2,600 feet of 54" reinforced concrete pipe at an estimated cost of $700,000. To keep the excavation dry at all times, the contractor operated a 6E4 Marlow pump 8 hours a day. With this efficient unit running at a capacity of 90,000 gallons per hour, not one day of work was lost because of seepage water. 8-276

The firm has used Marlow Pumps for over 10 years. During that time, they depended on Marlows for every pumping job no matter how tough it might be. The firm is well satisfied with the efficient, trouble-free operation of Marlow Pumps.

Marlow builds the most complete line of A.G.C. rated contractor pumps, Mud Hogs and pumps for every construction application. Write today for the name of your Marlow dealer and Contractor Pump Bulletin C-09.

Marlow PUMPS® **MARLOW PUMPS®**

DIVISION OF BELL & GOSSETT CO.

Midland Park, New Jersey

Morton Grove, Illinois • Longview, Texas

For more facts, use Request Card at page 18 and circle No. 264

Avoid legal pitfalls

Exchange of letters formed contract

THE PROBLEM: *A prime contract called for construction of cement-storage silos. Plaintiff offered, as subcontractor, to place all the steel reinforcing rods at $55 per ton, the "general contractor to furnish all rods, wire, and chairs, also all other accessories." The general contractor replied by letter that it was "understood" it would furnish use of a hoist to be operated by plaintiff, plus a crane manned by its engineer and oiler. The letter also stated that plaintiff would furnish all ground crews, and that it was not "contemplated" that the general contractor would furnish supports for the foundation-slab steel. The letter closed, "Please advise if this is your understanding." Plaintiff replied, "We accept all terms stated in your letter," mentioning date of job. Was a binding subcontract formed?*

THE ANSWER: Yes. (Youngstown Steel Erection Co. v. MacDonald Engineering Co., 154 Fed. Supp. 337, decided by the United States District Court, Northern District of Ohio.)

The court said that the general contractor had rejected the plaintiff's offer and, in effect, made a counter offer, which became a contract when plaintiff sent its second letter.

Accordingly, the general contractor was liable in damages on awarding the subcontract work to a third party.

Contractors' licenses

THE PROBLEM: *Nevada statutes require contractors to secure state licenses; they also provide that a contractor shall not be entitled to sue to collect pay for work unless he alleges and proves that he was licensed when the contract was made and performed. A contractor was paid for work which the owner claimed was negligently performed. The owner sued to compel a refund. Was the contractor entitled to defend the suit without alleging and proving that he was licensed?*

THE ANSWER: Yes. (Milum v. Herz Brothers Water Well Drilling & Supply Co., 329 Pac. 2d 1068, decided by the Nevada Supreme Court.)

The court decided that prohibition of right to sue could not be read as a prohibition of right to defend suit.

For more facts, circle No. 265→

Edited by A. L. H. STREET
Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Insurance did not cover use of defective cement

THE PROBLEM: *California contractors carried property-damage liability insurance, which specified inclusionary and exclusionary coverage. They bought cement for stucco construction. Because the cement was defective—a condition apparently unknown to the contractors and for which they were not at fault—the stucco cracked and had to be replaced. Subject to a clause excluding certain coverage, the policy insured the contractors against liability for injury to property. Did the policy cover the cost of replacing the stucco?*

THE ANSWER: No. (Volf v. Ocean Accident & Guarantee Corp., 316 Pac. 2d 651, decided by the California District Court of Appeal, Third District.)

The court reasoned: (1) The contractors never caused any damage to the property of the owner for which they were liable to the owner. Their obligation was to redo a job that had not been properly constructed, even though the defective cement had been accidentally selected by the contractors.

(2) The case came within a clause excluding coverage of property in the care, custody, or control of the contractors. While the work was being done, the contractors were in possession and control of the building.

Bidding irregularity did not void low bid

THE PROBLEM: *A New Jersey borough's notice to bidders on a building job specified: "The bidder will be required to furnish a performance bond in the amount of the bid and in the form to be approved by the borough attorney and, at the time the bid is submitted, proof that he will be able to furnish the bond." Plain-*

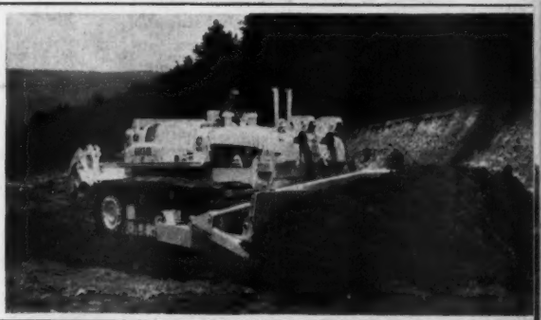
For a bidding advantage on that next job...

CHECK EUCLID'S BIG 3

World's most powerful tractor... two engines deliver 425 net h.p. to power trains... separate Torqmatic Drives and full power shift... independent track drives... 27" standard shoes... 8 track rollers... fast, easy operation... excellent accessibility for servicing.

Unequalled work-ability for push-loading big scrapers, bulldozing and ripping earth, rock, coal and ore, towing heavy equipment and other big tractor jobs.

TC-12 TWIN-POWER CRAWLER



All-wheel drive... two engines with a total of well over 500 h.p.... separate Torqmatic Drives... 24 cu. yds. struck... 32 yds. heaped... independent hydraulic controls... NoSpin differentials... 27.00 x 33 tires with 33.5 x 33 optional.

Moves the cheapest dirt on big, tough jobs as well as small yardage projects... works under adverse conditions that stop other scrapers.

TS-24 "TWIN" SCRAPER

30 cu. yds. heaped... 21 yds. struck... 336 h.p. engine... 4-speed Torqmatic Drive with converter lock-up... independent hydraulic controls for bowl, apron and ejector... structural strength for push-loading by biggest tractors... exceptional service accessibility.

Years-ahead design with proved productive capacity that outperforms every other big scraper in its class... dependability that cuts downtime and maintenance costs.

S-18 SINGLE ENGINE SCRAPER

EUCLID Division of General Motors, Cleveland 17, Ohio

Big Power...Big Capacity...Big Performance for Bigger Return on Investment!

GM GENERAL MOTORS EUCLID

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FOR MOVING EARTH, ROCK, COAL AND ORE

tiff's bid, the lowest, was $35,500, accompanied by a certified check for $4,000. The next low bid was $36,715 accompanied by a $3,800 check. The award was made on the latter bid, because plaintiff had failed to comply with the condition in the notice that it prove it could furnish a performance bond. (Evidently, the borough did not rely upon a condition, under which bids were received, that any bid might be accepted or rejected.) Plaintiff's belated offer to prove its ability to furnish bond was rejected. Was plaintiff entitled to a court order, requiring the borough to award it the contract?

THE ANSWER: Yes. (Murdock Contracting Co. v. Borough of Verona, 135 Atl. 2d 352, decided by the New Jersey Superior Court, Law Division.)

The court reasoned that the requirement for proof of ability to furnish bond was principally intended to apply to the successful bidder. Furthermore, the form of bond to be given was not approved before the bidding.

Municipalities have discretionary power to reject bids not complying with bidding conditions, but this rule presumes that there has been a substantial departure from the conditions imposed. The municipal function in this regard involves the public interest in having public contracts awarded to the lowest bidder. A mere irregularity in the form of bidding, without unfairness as to substance, will not justify rejection of the lowest bid.

Start of work delayed

THE PROBLEM: *A housing development involved present construction of nearly 1,000 units. Defendant, owner-construction company, awarded plaintiff a contract to roof the houses, but it did not specify when the structures would be ready for roofing. Defendant told plaintiff when work would start. About seven weeks after this date, work had not been started, and plaintiff sued for damages for breach of contract on a theory that work had not commenced within a reasonable time. Was the suit properly brought?*

THE ANSWER: Yes. (Stark v. Shaw, 317 Pac. 2d 182, decided by the California District Court of Appeal, Second District, Los Angeles.) In other words, defendant was bound to get the structures under way within a reasonable time and had failed to do so. Failure to do so justified plaintiff in regarding the contract as broken. The court also decided that the fact it was not possible for plaintiff to show the precise money loss sustained did not preclude an award of a sum reasonably approximating the loss. But it was necessary that plaintiff prove it was ready, willing, and able to have performed the roofing contract had it been permitted to do so within a reasonable time.

Contract release binding

THE PROBLEM: *In law when one signs a contract under compulsion, he is said to have acted under "duress" and may assert this as a defense in a suit against him on the contract. A roofing contractor, who had partly performed a subcontract with a prime contractor, refused to proceed unless the latter released him from liability for delay in performance. The contractor signed a release but later sought to avoid its effect on the ground that he had acted under duress in signing it. In litigation the contractor failed to show that he could not have had the subcontract work completed by another subcontractor if he had refused to give the release. Nor did he show that he could not have enforced a judgment for damages against the subcontractor for breach of his contract. Was the release binding?*

THE ANSWER: Yes. (Tri-State Roofing Co. v. Simon, 142 Atl. 2d 333, decided by the Pennsylvania Superior Court.)

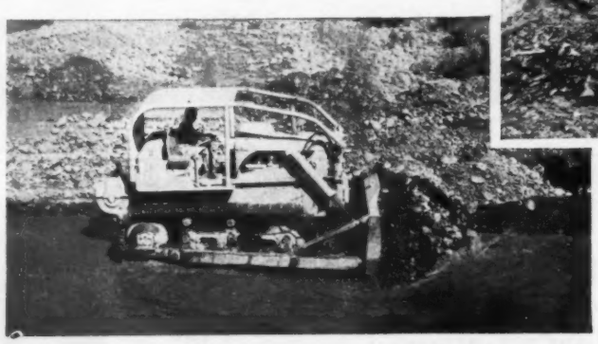
The court followed a declaration by the United States Supreme Court that "a threat to break a contract does not in itself constitute duress. Before the coercive effect of the threatened action can be inferred, there must be evidence of some probable consequences of it to person or property for which the remedy afforded by the courts is inadequate."

Injury to job visitors

THE PROBLEM: *A building-material salesman called on a contractor at a building under construction. He secured an order and was requested by the contractor to count the number of rafters and ceiling joists needed. The contractor warned him that, although the building was safe for walking and that subflooring was in-*

Only proven International delivers bonus to

Blade a bonus load—flip the Shuttle-Bar—and you reverse the TD-15 instantly and reposition fast! New TD-20 and TD-15 owners, the country over, are reporting "next-size-bigger" production from these proven models!



Bonus track roller life really counts for the TD-20 owner, working in the "grinding compound" of water-borne granite particles. Precision-lapped, floating, metal-to-metal seals in proven International track rollers provide never-before-equalled protection to keep out abrasives and keep lubricant in!

Years-Proven Planet Power Steering, unequalled undercarriage strength and ease of control make the TD-24 what many contractors call "the rock-dozer special" of all king-sized crawlers. "Live track" power with both tracks pulling *full time* means bigger dirt in every push!

International® Construction Equipment

International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers and Bottom-Dump Wagons... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.

stalled, he should watch out for an open stair well. Near the stair well, the salesman's foot caught in a hole, he lost his balance, fell into the stair well, and was injured. Was the contractor liable?

THE ANSWER: No. (Kagan v. Eisenstadt, 98 So. 2d 370, decided by the Florida Supreme Court.)

The court said that the salesman was bound to foresee that, due to the incomplete condition of the work, such a hole might exist. The court declared: "when an invitation is made to use the facilities of premises under construction, the invitation is made subject to the conditions that exist and the invitee must assume the risk of such conditions. It is reasonable to expect to encounter conditions which do not offer the safeguards of a completely constructed building when entering a building only partially constructed."

Public-job wages

THE PROBLEM: *A corporation engaged in highway contracting also operated an asphalt plant, selling material to others as well as utilizing it in the performance of its contracts. A man was employed exclusively at the asphalt plant and was paid wages fixed by the union contract under which he was employed. State law required payment of a higher rate to men employed on highway projects. Was this man entitled to the difference between the two rates?*

THE ANSWER: No. (Allen Co. v. Eden, 267 S. W. 2d 714, decided by the Kentucky Court of Appeals.)

The court stressed the fact that the man had been employed by the company at the plant before it got into highway construction. But the court seems not to have regarded that as a vital circumstance, for it said that it thought, as did the Supreme Court of Ohio in the case of Clymer v. Zane (128 Ohio St. 359, 191 N.E. 123, 93 A.L.R. 1245), that work performed in the production of materials used in the construction of a public project is not work on the project itself, though being carried on by the owner of the producing plant, where the materials are produced in a separate enterprise.

Subcontractor caused loss by uncontrolled fire

THE PROBLEM: *A highway contractor sublet the grubbing and clearing of a site, all of which had to be done before construction could start. The subcontractor's employees negligently permitted fire—generated in burning brush—to escape to adjacent rural church property. Was the contractor liable to the church society?*

THE ANSWER: No. (Bowyer & Johnson Construction Co. et al., defendants, appellants v. White et al., plaintiffs, appellees, 255 Fed. 2d 482, decided by the United States Court of Appeals, Fifth Circuit, affirming a decision by the United States District Court, Northern District of Mississippi.)

The court reasoned: The fact that the prime contract did not expressly authorize subletting of the work of grubbing and clearing the site did not forbid subcontracting and thereby make the subcontractor and his employees in legal effect employees of the prime contractor. Nor did the case fall within the general rule of law that, where certain work involves peculiar hazards of injury to adjacent property because of its inherent nature, an owner or prime contractor cannot avoid liability by delegating performance. The fire was not an essential part of the subcontract; it was merely a convenient means of disposing of the brush grubbed.

Unlicensed contractor is proved liable

THE PROBLEM: *A California contractor agreed to remodel a building. The owner did not know that the contractor was not licensed as required by state law. Progress payments were made before the contractor ceased work—because the owner refused to pay for repair work that he claimed was necessitated by the contractor's fault. The next day the owner discovered that the contractor was not licensed, and he employed others to complete the job. The owner sued the contractor for breach of his contract to remodel the building. Was he barred from suing, on a theory that the contract was void because the contractor was not licensed?*

THE ANSWER: No. (Dias v. Houston, 315 Pac. 2d 885, decided by the California District Court of Appeal, Third District.)

The court decided that because the owner was justifiably unaware that the contractor was not licensed he was not precluded from suing for breach of the contract. But the court seems to intimate that had the owner contracted for the work, knowing that the contractor was unlicensed, he could not have collected damages.

dependability tough-job performance!

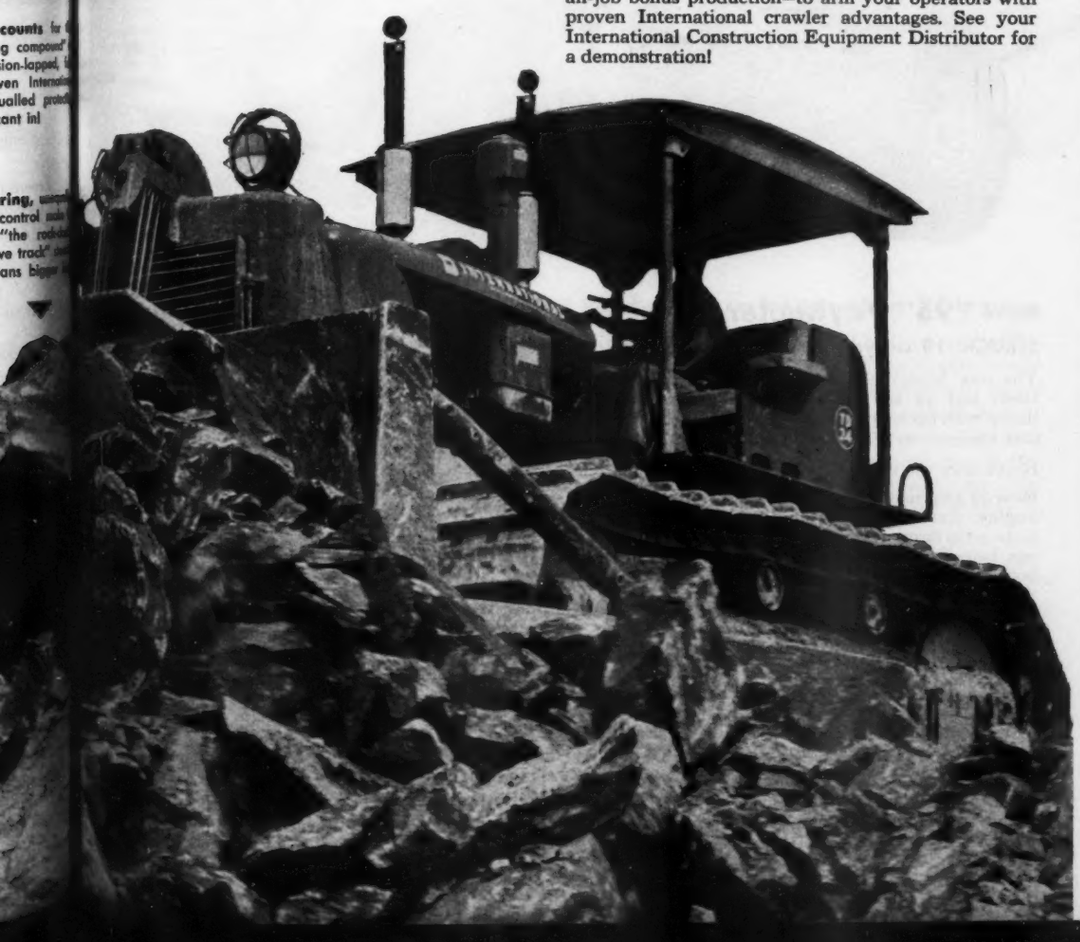
Only International provides heavy-duty-type track-rollers—the "originals," since 1956, with cartridge-type, floating metal-to-metal seals. Only International gives you heavy-duty roller bushings and king-size lube reservoirs, plus husky, big-diameter track roller shafts. Exclusive pressure relief passages guarantee positive prevention of seal blow-out or damage from power lubricators! Measure the advantages of proven International roller design in longer wear life, and downtime prevention!

Only International gives you the proven power-transfer efficiency and design simplicity of sintered metal-faced, dry-type engine clutches. With simple, uncomplicated operation, this heat-defying clutch operates efficiently at all temperatures—reduces lever pull up to 50%—needs no cooling system—delivers proven low upkeep!

Only International gives you proven exclusive cycle-speeding, load-increasing features—that pile up bonus production on tough or easy jobs. Only the TD-24 gives you Planet Power "live" track steering advantages—eliminates "dead-track drag"—pulls or pushes the same big loads on turns or straightaways—gives Hi-Lo power-shifting of either track on-the-go! And both TD-20 and TD-15 give you 6-speed, full-reverse transmissions with "single-stick" shift, and fast Shuttle-Bar forward-reverse control!

Big International crawlers give you smooth, high-torque, proven 6-cylinder diesel performance! You get 6-cylinder smoothness without "balancer" complications! For seconds-fast starting, lightning "load-follow" governing, and fuel-metering accuracy, compare proven International diesels!

See what it means in tough-job performance—and all-job bonus production—to arm your operators with proven International crawler advantages. See your International Construction Equipment Distributor for a demonstration!



←For more facts, circle No. 266

Uranium concentrator proje

A new industry means new plants, new construction at Riverton, Wyo. At left, crews work on the steel frame of the main structure of the uranium-concentrating plant. At center, finishing touches are being put on a 125,000-gallon elevated water tank. At far right is the ore crusher building.

The epidemic of "uranium fever"—the urge that drives men into almost inaccessible regions in search of the radioactive ore—is waning in the West. Taking its place is a new industry: the mining, concentrating, and refining of uranium ores.

Hardy prospectors still roam the deserts and mountains by Jeep, horseback, or afoot, but delicate mechanical and electronic devices are now being used in planes to map potential ore areas, and the pick-and-shovel method of extracting ore has practically been replaced by powerful mining equipment. Uranium-concentrating plants have sprung up in the Mountain States, providing another outlet for the skills of the construction industry. One of these uranium concentrators is the $3.5 million facility built for Fremont Minerals, Inc., at Riverton, Wyo., by Western-Knapp Engineering Co., San Francisco. Western-Knapp also designed the plant, which is based on the metallurgical design by H. L. Hazen, Inc., Denver, Colo.

Under a separate prime contract, Leonard Construction Co., Chicago, built a sulphuric-acid-producing plant on the same site. The acid plant, rated at 100 tons per 24 hours, also produces steam as a by-product. Excess steam not required in the acid-manufacturing operation is piped to the concentrator for use in processing the ore.

Has six structures

Like other ore-concentrating processes, the uranium concentrator crushes and grinds the material, then separates the ore from the waste by chemical and mechanical treatment. In the Riverton plant there are six structures, but all the mechanical operations are conducted in two of these.

The main building is a 280×135-foot mill, 50 feet high, which houses most of the machinery. This is a steel-frame building with corrugated-metal walls and a flat corrugated-metal roof deck. Over the metal deck is a layer of insulating concrete and a built-up roof.

The nearby crusher building, which measures 84×23 feet, is also 50 feet high and is of similar construction. Raw ore is stockpiled outside the crusher building over a big tunnel housing a conveyor that leads to the crushers. The ore, passing the crushers, is conveyed to the mill

New 19 and 2-

- 375 and 250 hp engines
- 30% less body weight
- 14% faster haul speeds

NEW "95" Payhauler

STRUCK: 18 cu. yd. PAYLOAD: 27 tons

The new Model "95" Payhauler moves payloads faster and for less money than any 27-ton rear dump with cycle-speeding 375 hp under the hood and elimination of all free-loading body weight.

Here's why the new "95" earns more for you:

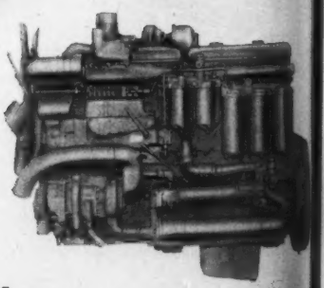
New 375 hp turbo-charged International diesel engine plus rugged yet tons-lighter• corrugated body gives best power-to-weight ratio of all similar rigs, helps move payloads 14% faster on all grades both up and down.

Speeds to match all loads and roads with choice of torque-converter with powershift, or 9-speed, constant-mesh transmission. Haul speeds to 38 mph.

Faster reversing, up to 7.1 mph with gear-drive model speeds spotting or positioning for dumping.

Load-speeding safety and unequalled operating ease with power steering, torqmatic braking, and full-sweep vision.

11-second dumping with exclusive inverted hoist action and industry-topping snubber mechanism.

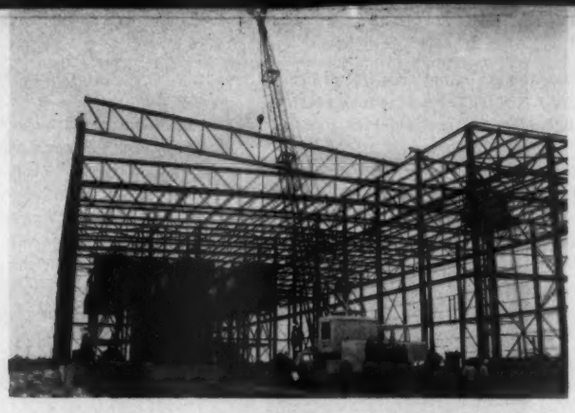


Great new 375 hp and 250 engines

Both Payhauler models have a big power plus under hood. The "95" is powered by this all-new Internati DT-817 375 hp turbo-charged diesel while the "65" is p ered by the same basic engine, the naturally aspir D-817, that develops 250 dependable low cost hp. Both heavy-duty, high-speed, direct-start, 4-cycle, 6-cylinder els thoroughly proved in six years of development and t ing. Both are products of 26 years of International exp ence building heavy-duty diesels for rugged applicati

emands specialty work

Plant for concentrating uranium ore is built in one season; six buildings, sulphuric-acid manufacturing plant make up job



A roof truss for the 280×135-foot main building of the plant is raised into place by a Michigan T24 truck crane. Workmen are waiting to pin and bolt the ends. The crane is operating with a 70-foot boom and 15-foot jib.

building for further processing.

Other structures in the layout include office and laboratory buildings, which are of concrete-block and frame construction; a 125,000-gallon elevated water tank and accompanying distribution system; and the acid-manufacturing plant.

Concentrator

The concentrator and crusher buildings and some of the heavy equipment in them are supported on spread concrete footings in the gravel soil. These footings are 5 feet below the surface, enough to be out of reach of frost penetration. Michigan T24 and T20 truck cranes fitted with dragline and backhoe attachments excavated the footing trenches, and pumps held the ground water level down while concrete was being placed.

Ready-mix concrete was delivered from Riverton and placed directly from the trucks or with buckets handled by one of the Michigan cranes. A continuous grade beam around the entire building rests on the footings and provides the base for the superstructure.

Some of the heavy items of machinery rest on separate foundations, which were placed along with the building foundations. Larger pieces of equipment, such as the six big Eimco filters that weigh 13 tons each, were set in place before the building superstructure was started.

The structural-steel frames of the

(Continued on next page)

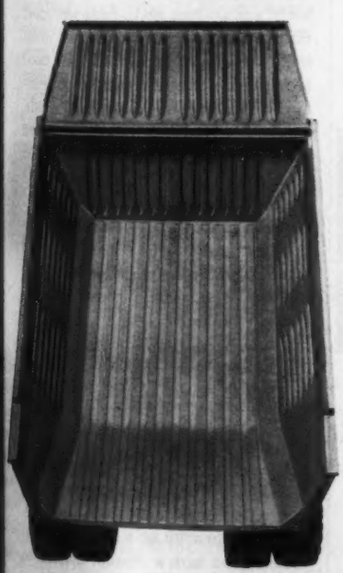
All types of earthmoving operations and miscellaneous work were handled by this Michigan Model 75A tractor shovel. Just now, it is placing backfill inside the grade beam of the main mill building.

d 2-ton Payhauler® models

NEW "65" Payhauler **STRUCK: 12.5 cu. yd.** **PAYLOAD: 19 tons**

The new Model "65" Payhauler sets new performance standards as the only 19-ton off-highway truck on the market...new 250 hp naturally aspirated International diesel engine...best power-to-weight ratio...new rock-ribbed body with tons less deadweight...10-speed constant-mesh transmission that helps bonus power speed more paydirt...speeds to 36.37 mph...and cab comfort and safety features that let the operator keep his mind on his work rather than on truck controls.

For a refreshing experience in what's new in rear dumps, invite your International Construction Equipment Distributor to bring either Payhauler to your job for a showdown demonstration against your present haulers.



Biggest body improvement in 25 years

International corrugated quarry and standard bodies are the industry's biggest body improvement in 25 years. Corrugated panels—with triple the strength of conventional flat steel plates—cut body weight 30% in sides, front, canopy, and subfloor at no reduction in strength or protection to operators. Loads being dropped onto the body wear floor are cushioned by up to 26 corrugations in the sub-floor. Patent applied for heated bodies have no cold spots, create no damaging exhaust back pressure. Benefit: haul payloads without hauling up to 5000 pounds of free-loading steel each cycle.

International® Construction Equipment

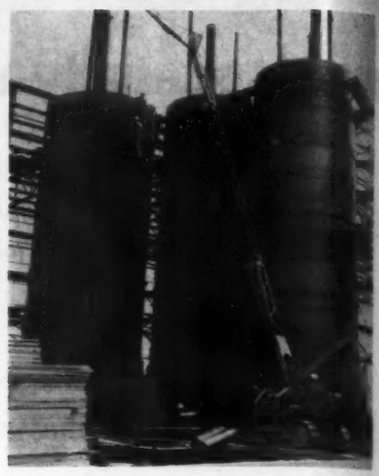
International Harvester Co., 180 North Michigan Avenue

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers and Bottom Dump Wagons . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

For more facts, use Request Card at page 18 and circle No. 267

This Pitman Hydra-Lift crane mounted on a Crane Carrier Corp. truck was a real work horse around the job. Here it lowers material into a pit, where men are assembling the conveyor system for the tunnel under the ore stockpile.

An International tractor with a 40-foot boom and 10-foot jib lifts tools and materials to men working on tanks at the plant. Hammond Iron Works, Provo, Utah, also used the rig to erect the tank sections for the plant.



(*Continued from preceding page*)

concentrator and crusher buildings were raised by a crew using the Michigan T24 crane equipped with a 70-foot boom and 15-foot jib. The roof trusses had been delivered to the site in two sections, which were welded together on the ground before the trusses were erected. Field connections in the steel frame were made with high-tensile bolts tightened with Ingersoll-Rand impact wrenches using air furnished by a pair of Le Roi 125-cfm compressors.

Between 500 and 600 items of processing equipment were installed in the buildings. One of the rigs that proved a real work horse in the handling and setting of the heavier items was a Pitman Hydra-Lift crane mounted on a Crane Carrier Corp. truck. Another piece of equipment that got a good workout was a Michigan 75A tractor shovel. This rig handled excavation, backfilling, finegrading, and other earthwork chores, and it also lifted and carried heavy items of material and equipment around the site.

Steel tanks are sublet

Several steel tanks in and adjacent to the concentrator building were furnished and erected by Hammond Iron Works, Provo, Utah. The field erection crews used an International tractor equipped with a 40-foot boom and 10-foot jib to raise the steel tank sections into place and hold them for the welders. This crew used four Lincoln 400 and 500-amp welding generators to make the field welds. Hammond Iron Works also supplied and erected a number of tanks for Leonard Construction Co. on the sulphuric-acid plant.

The elevated water tank and its 110-foot tower were furnished and erected by Graver Tank & Mfg. Co., Chicago. The general contractor installed the underground piping for the water distribution system. The supply well was drilled by Sullivan & Boyd of Riverton.

Sulphuric-acid plant

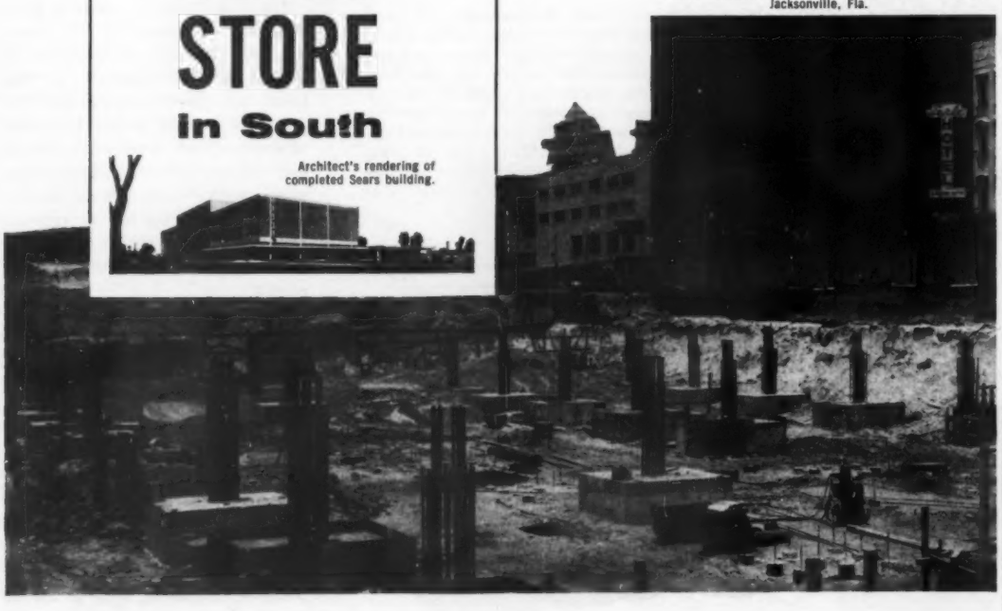
The contact sulphuric-acid plant, built under a separate prime contract by Leonard Construction Co., Chicago, consists primarily of a series of steel vessels lined with acidproof brick and

LARGEST SEARS STORE in South

Architect's rendering of completed Sears building.

New steels are born at Armco

Architects: Weed, Johnson, Associates; Miami, Fla.
General Contractor: Batson-Cook Co., West Point, Ga. and Jacksonville, Fla.
Piling Contractor: Duval Engineering & Contracting Co., Jacksonville, Fla.



Supported by Armco Pile Shells

New retail store of Sears, Roebuck & Co., now being constructed in Jacksonville, Florida, will be their largest in the South, having 132,000 square feet of actual sales area.

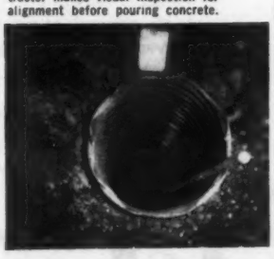
To support this building, more than 900 Armco HEL-COR® Pile Shells were mandrel-driven to specified loadings. These shells, supplied in 16 and 18 gage in 12¼-inch diameters, were driven to depths ranging from 16 to 40 feet. The foundation required 20,000 feet of pile shells.

The foundation contractor averaged 44 piles driven per 8-hour day for the entire job, using a mechanically-expanding mandrel with a driving force of 15,000 ft./lbs.

The attractive building, with an exterior of pink Roman brick, is scheduled for completion early next fall.

For more information on Armco Pile Shells, write us. Armco Drainage & Metal Products, Inc., 6709 Curtis Street, Middletown, Ohio. In Canada: Guelph, Ontario.

Looking down into mandrel-driven Hel-Cor Pile Shell at Sears site. Contractor makes visual inspection for alignment before pouring concrete.



ARMCO DRAINAGE & METAL PRODUCTS

Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company
The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

For more facts, use Request Card at page 18 and circle No. 268

acidproof mortar. In addition, there is a waste-heat boiler that generates steam to power an Elliott steam-turbine-driven blower, which in turn circulates the gases in the acid-manufacturing plant. The excess of steam generated in the waste-heat boiler is piped to the nearby concentrator, where it is used in processing ore.

Included in the acid-plant structures are a 1,000-ton acid-storage tank, a number of 42-foot-high processing towers, and a 70-foot-high stack. The circular steel tank structures have a circular retaining-wall type of footing around the outside, with a foot-thick concrete slab on a compacted gravel base within the wall. A ½-inch expansion joint separates the slab and wall.

After Hammond Iron Works erected the steel tank structures, Leonard's crews installed the brick linings and other equipment. Cranes and other equipment necessary for the erection were rented locally.

Personnel

Western-Knapp Engineering Co. crews, which at the maximum numbered 175 workmen, were supervised by a staff headed by superintendent E. M. Nicholson and assistant superintendents W. G. Jones and LeRoy Woods. Project engineers on the plant design were John White and H. L. Clark. The field engineer was Harold Hill.

On the tank work, the field foreman for Hammond Iron Works was Dale Wilson. Leonard Construction Co. crews on the acid plant were under the direction of superintendent L. P. Boiler.

Jerry Bryant, mill superintendent for Fremont Minerals, Inc., was on the job during design and construction, representing the owner and becoming familiar with all details of the plant as the work was done.

THE END

Gardner-Denver produces film on its history

"What's in a Name?" has been produced by Gardner-Denver Co. to show how the firm grew from a one-room shop to a world-wide company in 100 years. The 17-minute sound and color film describes how its products serve the fields of construction, mining, and general industry.

The film can be obtained for showing without charge to schools, clubs, or other interested groups by writing to the Film Library, Gardner-Denver Co., Quincy, Ill.

FWD offers booklet on heavy-duty vehicles

An eight-page booklet, "World's Most Unusual Vehicle Facility," illustrates and details FWD Corp. plant facilities and vehicles. It lists the industries and markets served by the company, shows examples of the unusual vehicles produced for those markets, and tells how each vehicle solved specific problems.

Copies of the booklet may be obtained from the FWD Corp., Clintonville, Wis.

Third world congress for building research

The International Council for Building Research, Studies and Documentation, C. I. B., will hold an international congress September 21 through 25 in Rotterdam. The congress will be devoted to a number of problems of fundamental importance to the building industry. The subjects will be introduced by leading experts from various countries and subsequently be put up for discussion.

The subjects relate to theoretical and applied building research and to building documentation. In addition, attention will be given to some special aspects of building in tropical countries.

A provisional program already set up includes discussion on the design and calculation of construction, and safety factors; an introduction to the normalization of dimensioning on the building site, tolerances, and dimension control; research problems concerning heavy concrete elements; and flat roofs.

Joint venture to build breakwater off Nigeria

A 6-mile rock-fill breakwater will be built in the Atlantic Ocean off Nigeria, Africa, by a joint venture of Richard Costain, Ltd., London, and Raymond International (U.K.), Ltd., London, a subsidiary of Raymond International Inc., New York City.

The $21 million contract calls for a 29,650-foot breakwater to be built into the sea at the mouth of the Escravos River, to prevent drifting sands on the ocean floor from blocking the offshore channel leading to the Escravos estuary. When the new breakwater is completed, the offshore channel will be dredged, permitting ships with 20-foot drafts to enter the deep-water rivers and creeks beyond the estuary. About 1,250,000 yards of quarried rock, ranging in size up to 10 tons, will be required for the job.

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"Back-dragging" bank material by the truck-load, this TD-15 4-in-1 shows one (of dozens!) of its exclusive clamshell applications! This long-reaching action can also grade slopes; clean ditches; give space-saving, one-gulp bucket-full bites of loose materials; load stumps or other "impossibles"; give positive bottom-dumping that eliminates the sticky materials problem!

As an inch-close-accurate "carry-type scraper" the 4-in-1 can often double for blade grader or tractor-towed scraper. And the 4-in-1 can do closely-controlled *grading, stripping,* or *spreading* in quarters too cramped for long-hitched equipment. This TD-20 4-in-1 is the "one-man equipment fleet" on a big housing project.

Simply lift the clam lip (hydraulically)—and the clam-action 4-in-1 gives you a big-capacity blade. *Curved to roll the earth—"beefed" to dig hard materials—positively depth-controlled to do accurate work!* This contractor-owned TD-20 4-in-1 proves you'd need a full-sized bulldozer, *and a good one,* to match 4-in-1 dozing performance!

Prove to yourself an International Drott TD-15 or TD-20 4-in-1 gives you mass-production efficiency, along with versatility unlimited! Match exclusive 4-in-1 pry-action break-out and loading capacity against any obsolete single-action loader! Measure shock-swallowing Hydro-Spring advantages. Count the machines a 4-in-1 can replace, to save you up to $100,000 on equipment. See your International Drott Distributor for a demonstration!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL DROTT

For more facts, use Request Card at page 18 and circle No. 269

A big girder section for the Fourth Street Bridge in Pueblo, Colo., is swung from a railroad flat car to a Ford truck and trailer combination by a Bucyrus-Erie 22-B. This is one of the sections going into a 403-foot continuous girder over two spans of a 1,070-foot-long bridge.

The semitrailer follows the Ford truck around curves and down steep grades to the erection site. The semitrailer is tied to the girder, which rests on a swinging bolster in the back of the Ford truck bed. Sections for the 403-foot girders measured up to 87 feet long and weighed as much as 20 tons.

Big plate girders are set for bridge over railroads

Contractor works with three railroads to keep yards in service while bridge girders are being set

Setting huge plate girders on bridge piers without interfering with traffic in busy railroad yards beneath was one of the trickiest operations in the construction of the Pueblo, Colo., Fourth Street Bridge that spans the Arkansas River and the tracks of three railroads. Careful planning by the contractor and plenty of liaison

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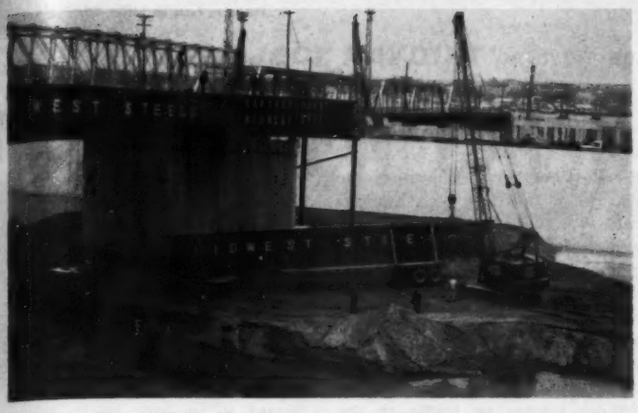

In the limited room afforded by the temporary road built in the river bottom, it was almost impossible for the truck and trailer combination to maneuver. The American 595 crane is picking up the trailer—girder and all—to swing it into a better position.

The American 595 and Bay City crane work from one side and a 50-ton crawler from the opposite side to swing the 20-ton section into place on the falsework. Five of these sections, field-spliced with high-tensile bolts, make up the 403-foot continuous girder.

with the railroads spelled success for the job.

The project was built by Gardner Construction Co., Glenwood Springs, Colo., under a $1,466,899 contract with the Colorado Department of Highways. The bridge carries Colorado 96 over the river and over the tracks and yards of the Denver & Rio Grande Western, Missouri Pacific, and Santa Fe railroads.

The 1,070-foot-long structure rests on two abutments and six piers and has seven plate-girder spans ranging in length from 117 to 202 feet. The two longest spans have continuous girders 403 feet long. Nine girders side by side at 8-foot centers support the deck slab, which consists of two 28-foot roadways separated by a 4-foot-wide raised median with 4-foot walks on either side.

Substructures

Two piers in the Arkansas River are founded on spread footings on bedrock. Other piers and abutments are on piling. The south abutment rests on H-piles driven through the approach embankment. Other piers are on 12¾-inch-OD steel-tube piles. These tubes, with a wall thickness of 0.265 inches, were filled with concrete after being driven.

Most of the piling was driven by a Syntron diesel pile hammer with an energy output of 50,000 foot-pounds per blow. The hammer was handled in 60-foot telescoping leads by an American Model 595 crawler crane.

Piers consisted of five separate columns, each on its own footing of 8 or 10 piles. The piles were capped off about 4 or 5 feet below ground level with a 3-foot-thick concrete footing. The 3-foot-square columns rise from the footings to a 3×4-foot cap, which is the seat for the girders. Forms for the columns and caps were built of ¾-inch plywood with 2×4 backing rodded through with rods and she-bolts.

Concrete for the piers and abutments was delivered to the site in transit mixers and placed with Gar-Bro 1-yard buckets handled by a Bay City and a Link-Belt motor crane. Rubber and metal tremies guided the concrete to the bottom of the deep column forms to prevent segregation.

Fortunately, the piers of the new bridge structure lined up with those of the nearby existing structure; little or no adjustment of the tracks was necessary. One railroad light tower, 117 feet tall, had to be relocated. The Bay City and Link-Belt motor cranes picked the tower intact from its old mountings and set it in place on the new footings.

Setting big girders

To permit the cranes to operate through the railroad yards, the contractor built a road through the yards on the alignment of the bridge. It was still necessary to set planks so that cranes could turn without disturbing the tracks.

With careful planning and timing, it was possible to set most of the smaller girders directly from the railroad cars on which they were de-

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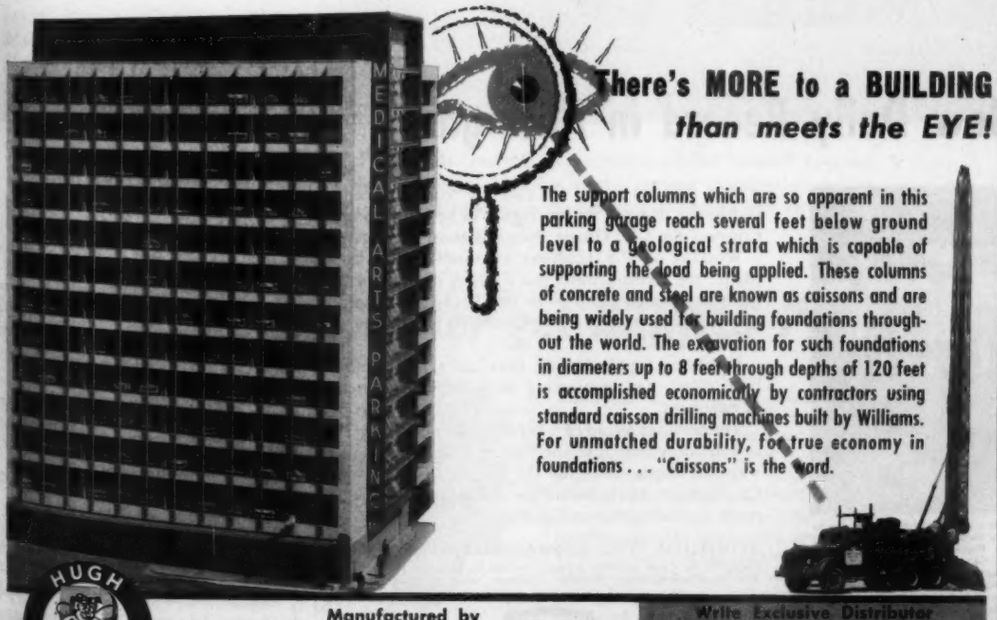

There's MORE to a BUILDING *than meets the EYE!*

The support columns which are so apparent in this parking garage reach several feet below ground level to a geological strata which is capable of supporting the load being applied. These columns of concrete and steel are known as caissons and are being widely used for building foundations throughout the world. The excavation for such foundations in diameters up to 8 feet through depths of 120 feet is accomplished economically by contractors using standard caisson drilling machines built by Williams. For unmatched durability, for true economy in foundations . . . "Caissons" is the word.

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DITCH WITCH
9.2 HP M-3 3 SPEEDS

★ TRENCHES 1200-2400 FT. PER 8-HOUR DAY!

ABOUT 2c A FOOT IS USUAL TRENCH COST! ★

★ CAN PAY OUT IN 4 WEEKS, EASILY EARNS $120 A DAY!

★ DIGS ANY SOIL THAT CAN BE DUG BY ANY MACHINE!

FEATURES: Sealed planetary geared reduction unit eliminates excess belts, sheaves, chains and sprockets. Telescoping boom and sectional chain easily adapt unit for maximum performance on any job.

Trenches 3-8" wide, up to 4' deep; digs road crossings; gas, water, electric and telephone service lines; undercuts sidewalks; and trenches for ground wires, street lighting, traffic signals, sprinkler systems, footings, etc.

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Concrete for the deck slab is delivered by transit mixer and sped to the point of placement by a Whiteman power buggy. The buggy works on wood panels supported by metal horses that have pipe legs resting on the girder flanges. The weight of runways and buggies is never on the forms. At left is the power unit of the Master vibrator being used to work concrete down around the reinforcing.

(Continued from preceding page)

livered. These were girders for the 117, 119, and 129-foot spans. The girders were 60 or 66 inches high and weighed up to 18 tons. Under an arrangement with the railroads, the cars carrying the girders were spotted directly under the span on which they were to be set. Cranes, waiting when the girders arrived, picked the steel off the cars and set them in place without holding up traffic on the track more than a predetermined number of minutes.

The longer and heavier girders for the 182 and 202-foot spans were set in sections. They rested on falsework until the field splices could be made. These girders were 9 feet deep, and the largest sections, 87 feet long, weighed 20 tons. Five of these sections were field-connected to form the 403-foot continuous girders spanning the river.

As these larger girders were delivered to the site, the cars were spotted on a siding at one side of the yard, and a pair of Bucyrus-Erie 22-B truck cranes transferred the heavy sections to a truck and trailer combination. The truck was a long-wheelbase heavy-duty Ford with a flat bed. A rotating bolster on the truck bed carried one end of a girder; the other end was mounted on a large flat-bed trailer that was securely attached to the girder but was separated from the truck.

This rig had to travel from the siding up over the existing bridge, across a dike, and down into the nearly dry bed of the Arkansas River. Temporary roads had been built over the dike and in the riverbed, but there was a considerable amount of grade and curvature to be negotiated.

Once the rig arrived at the required spot in the riverbed, several big cranes, including an American Model 595, a Manitowoc 50-ton crawler, a Bay City motor crane, and an American 395, set the heavy sections in place on falsework until field connections could be made. The larger cranes made the heavy lifts, while the smaller ones handled the diaphragms and other lighter sections.

There was one tense moment when one of the first big girder sections was being delivered down the dike road into the riverbed. The truck driver applied the truck brakes, slowing up the truck on a curve on the relatively steep grade. The trailer and the huge section of girder failed to stop, plowing straight ahead and missing the cab of the truck by inches. Provision for control of the trailer brakes eliminated the possibility of a recurrence of the accident.

All field splices in the girders and the attachments of diaphragms were

Denton Company's paving crews, using Bethlehem road steels, established a new record of 6,029 ft in a single day.

Pavers Set New Daily Record in Michigan

Michigan State Highway Department officials meet at the job site shortly after the record was established. Left to right: Gordon Thomas, Ontario Highway Dept.; Leet Denton, Contractor; C. B. Laird, *Chief Construction Engineer*, Michigan State Highway Dept.; J. C. Mackie, *Michigan State Highway Commissioner*; Charles Ledsman, *General Superintendent*, Denton Construction Co.; Frank Skebonsky, *Metro. District Road Engineer*, Michigan State Highway Dept.; Carlan Weber, *Chief Engineer*, Michigan State Highway Dept.; Mickey Palmer, *Project Superintendent*, Denton Construction Co.; and Pete Branstrom, *Project Engineer*, Michigan State Highway Dept.

A new national record for concrete road pavement laid in one day was set on August 12 by the Denton Construction Co., Grosse Pointe Woods, Michigan.

Working on U.S. Highway 23, south of Dundee, Mich., the Denton crews laid 6,029 ft of nine-inch-thick pavement 24 ft wide in 12½ hours, announced by Michigan State Highway officials as the new national record.

Bethlehem supplied mesh, dowel units, hook bolts, base plates and reinforcing bars for this stretch of pavement.

The previous record of 5,787 ft in 12½ hours was set in July, on a stretch of the Detroit-Chicago expressway near Battle Creek, by the Sargent Construction Co., Saginaw, Mich. Bethlehem also supplied the road steels for this stretch of highway.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

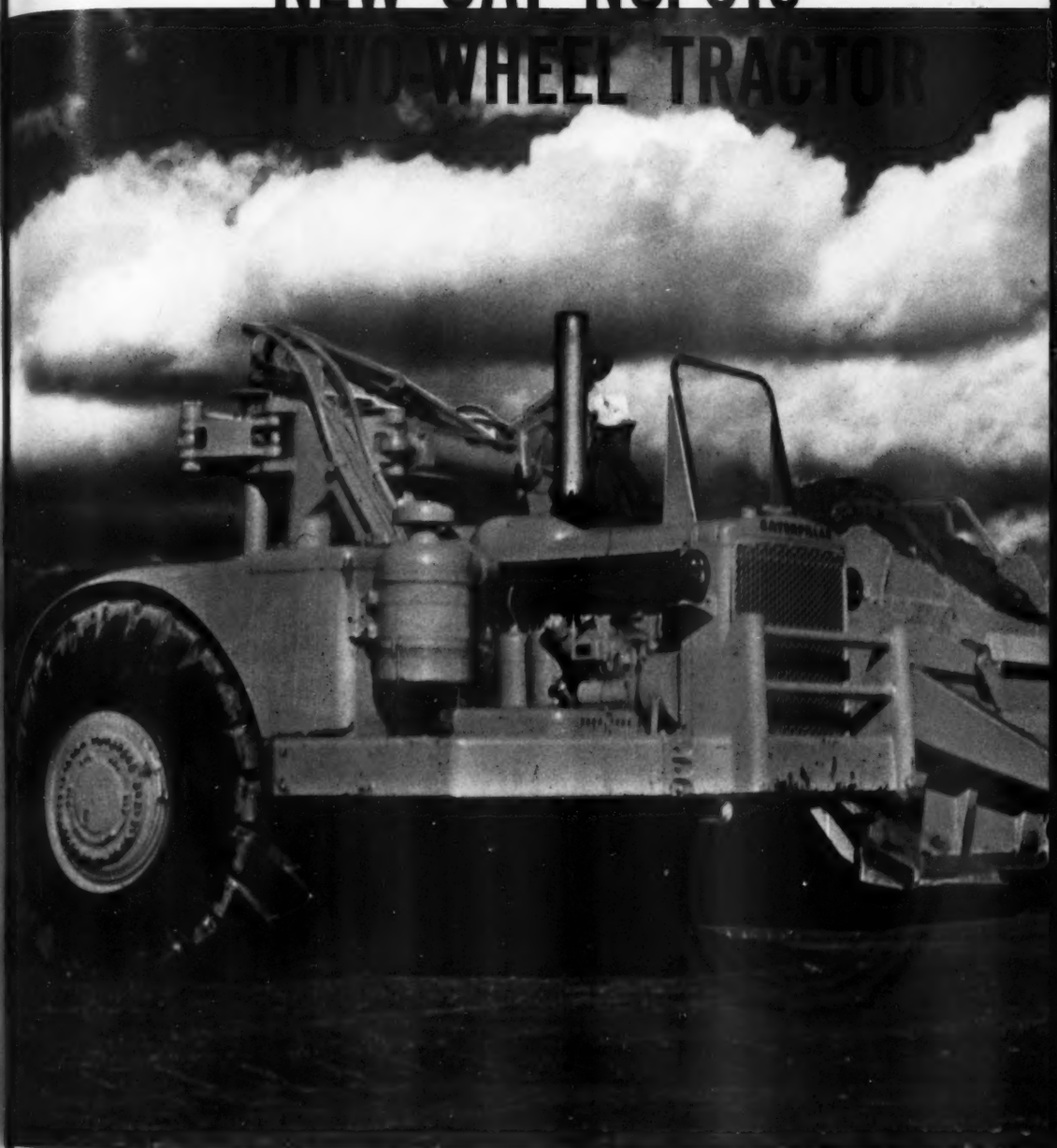
For more facts, use Request Card at page 18 and circle No. 274

Workmen place the double 2×6 wales, which are suspended from the girder flanges with Superior hangers. Spanning between the wales in the other direction are 2×4 joists that support the deck form.

CATERPILLAR'S
PROJECT
PAYDIRT

PROJECT PAYDIRT *pays off again*

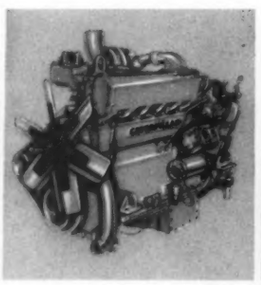
NEW CAT NO. 619
TWO-WHEEL TRACTOR



PROJECT PAYDIRT: Caterpillar's multimillion-dollar research program —to meet the continuing challenge of the greatest construction era in history with the most productive earthmoving machines ever developed.

NEW 225 HP CAT NO. 619 TRACTOR

New Swing-away Dash. Permits timesaving access to the starting engine, air compressor and hydraulic pump. Entire left side of engine can be exposed without having to disassemble any major components connected with dash.

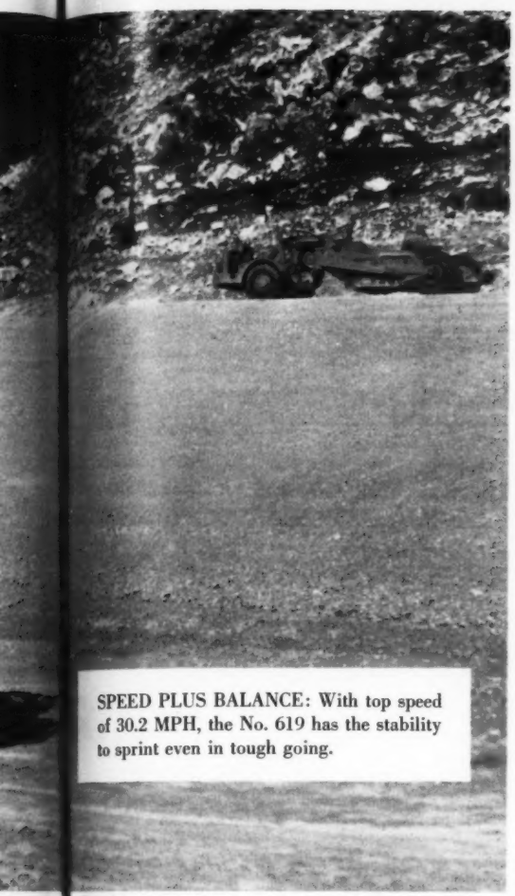


New Turbocharged Cat Engine. Meets the specific requirements of the No. 619. Develops 225 HP and a full 20% torque rise — for fast acceleration on cut or haul road. Fuel system permits use of economy-type fuels.

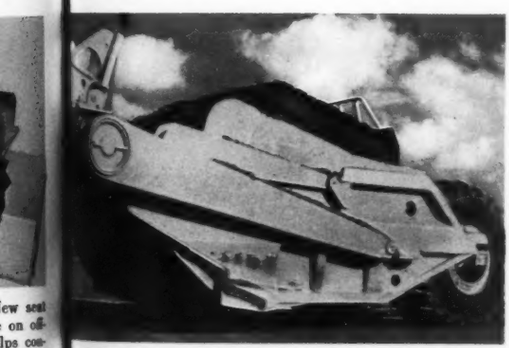
Fast Servicing. Unit construction offers unmatched accessibility to the transmission, differential and cable control. They can be quickly removed from tractor for servicing. Each axle can be pulled out by removing only 6 capscrews.

New Torsionflex Seat. New seat provides "highway" ride on off-highway conditions. Helps conserve operator's energy, lessens his fatigue, enables him to do more work per shift. The seat is standard on the new No. 619.

OR AND 14 CU. YD. NO. 442 SCRAPER



SPEED PLUS BALANCE: With top speed of 30.2 MPH, the No. 619 has the stability to sprint even in tough going.



New No. 442 Series B LOWBOWL Scraper. Matched to the No. 619 for high production and fast loading. Capacity ratings: 14 cu. yd. struck and 18 cu. yd. heaped. Also available is the 25-ton-capacity Athey PR619 Rear Dump Trailer.

• First two-wheel tractor to deliver four-wheel speed and roadability!

• Matched with new No. 442 Series B LOWBOWL Scraper for new high production... 14 cu. yd. struck, 18 cu. yd. heaped!

The new No. 619 Series B represents a major breakthrough in two-wheel tractor-scraper design. It combines two-wheel traction with four-wheel speed and roadability for high productivity on a wide range of applications. And that's not all. It affords new type unit construction and timesaving accessibility never before built into this type of machine.

The No. 619 has a new Turbocharged engine that delivers 225 HP. This rugged engine develops a torque rise of 20%—for fast acceleration. It provides a top speed of 30.2 MPH. The No. 619 can really get out of the cut and run—and run under conditions that slow down other make two-wheel rigs.

That's because of its roadability. Advance Caterpillar design has achieved a tractor-scraper balance resulting in rides that "smooth out" to an amazing degree. This balance permits higher speeds for more cycles per hour. It also lessens operator fatigue for more cycles per day.

With all this, new 2-jack hydraulic steering makes the No. 619 extremely easy to maneuver, yet retains that important "feel of the road" touch. Design permits full 90° turns and a turning diameter of 30 feet.

As for accessibility, here's one example: A new swing-away dash allows ready access to the starting engine, air compressor and hydraulic pump with a minimum of time and effort. Another example: By removing six capscrews in the planet carrier cover, each axle can be removed from the tractor. The planetaries are interchangeable between sides.

Like all achievements of Caterpillar's Project Paydirt, the No. 619-No. 442 unit has been thoroughly job tested. Four years of in-the-field operation prove this: on every count — production, accessibility, economy — this new rig outperforms other make machines.

How much does this mean to you profit-wise? Of course, that depends on your jobs. But this is certain—there's nothing like the new No. 619—No. 442 in the field today. Get the complete facts about it from your Caterpillar Dealer. Ask for a demonstration. See for yourself how it can step up production and profits on a wide range of applications.

Additional facts about the No. 619-No. 442

Six-speed forward, two-speed reverse constant mesh transmission • Standard wide-base 26.5—25, 24-ply tubeless tires all around—optional treads and ply ratings available • Choice of in-seat gasoline starting or direct electric starting • Fuel tank capacity—85 U. S. gallons • Shipping width—10′ 10″.

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No other manufacturer offers the complete earthmoving line-up that Caterpillar does. No matter what type of machine you need, you'll find a Caterpillar unit to meet your specific requirement. What's more, each machine is a modern, heavy-duty unit, designed to do more work at lower cost with less down time than any in its class. That's because Caterpillar keeps every model up to the minute with design developments and improvements sparked by Project Paydirt.

The new No. 619-No. 442 is one of many examples of this leadership in action. Here's the line-up:

5 Track-type Tractors: Led by the "take-charge" D9 (320 HP), there's the new D8 (225 HP), D7 (140 HP), D6 (93 HP) and D4 (63 HP). All are flywheel ratings. Plus a complete selection of 'dozers (including the No. 7G Bulldozer), rippers, tool bars and tool bar equipment.

3 Motor Graders: You have a complete selection in the big new 150 HP, 29,280 lb. No. 14; the 115 HP, 23,000 lb. No. 12 and the 75 HP, 20,805 lb. No. 112. Cat Motor Graders are known as "the standard of the industry." Optional on all three: the now transistorized Preco Automatic Blade Control, which maintains blade accuracy of ⅛" in 10'.

3 Traxcavators: The front-end loaders provide a range of capacities that meet every purpose—No. 977 (2¼ cu. yd. bucket); No. 955 (1½ cu. yd.) and No. 933 (1⅛ cu. yd.). All can be equipped with the exclusive Side Dump Bucket, or other quick-change attachments—special buckets, teeth, bulldozers or forks.

4 Wheel-type Tractors: Besides the new No. 619, the two-wheeled DW21 (345 HP, max.), the four-wheeled DW20 (345 HP, max.) and DW15 (200 HP, max.) team with matching LOWBOWL Scrapers: the No. 470 (19.5 cu. yd. struck), No. 482 (24 cu. yd. struck), No. 456 (19.5 cu. yd. struck) and No. 428 (13 cu. yd. struck) respectively. Athey Trailers couple with Cat wheel-type Tractors for rear or bottom dumping.

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Caterpillar Tractor Co., San Francisco, Calif.; Peoria, Ill., U.S.A.

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EARTHMOVING EQUIPMENT

BORN OF RESEARCH
PROVED IN THE FIELD

made with high-tensile steel bolts tightened by air-powered Thor impact wrenches. The 5 million pounds of structural steel for the bridge was fabricated and erected by the Midwest Steel & Iron Works Co., of Denver.

Forms hung from girders

Using Superior hangers, crews hung the forms for the deck slab from the top flange of the girders. Double 2 × 6 wales were suspended from the hangers on long bolts. The wales paralleled the girders and were suspended from hangers spaced at 4-foot intervals along the girders. The deck of ¾-inch plywood rested on 2 × 4 joists bearing on the double 2 × 6 wales.

Concrete for the 7½-inch-thick deck slab was furnished by Fountain Sand & Gravel Co. and delivered to the job in transit mixers. Whiteman power buggies and Bell Prime Mover power buggies brought the concrete from the transit mixers to the deck slab. The power buggies operated on runways of wood panels supported on steel horses. These horses, made of steel channels with pipe legs, were long enough so that the legs always rested on the girder flanges. This meant that the weight of the runways or buggies was never on the forms.

The deck contained about 2,400 cubic yards of concrete. Added to the 1,200 cubic yards in the substructures, this makes a total of about 3,600 cubic yards. The finished deck has an overlay of 2 inches of plant-mix asphaltic-concrete surfacing. This paving, together with the grading and paving of the approaches, was sublet to Broderick & Gibbons, Pueblo.

As soon as the new bridge could be put into service, the old bridge was dismantled and removed. Two spans were reassembled on minor roads at new locations; the remainder was removed for salvage. The old piers were removed to ground level.

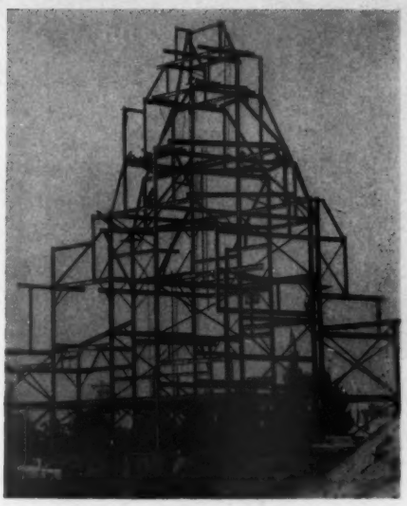
Personnel

The superintendent for Gardner Construction Co. on the project was Raymond Burns. William Hasse was assistant superintendent. Others on the supervisory staff were carpenter superintendent Alex Michael, carpenter foreman Harold Dinkle, labor foreman George Monks, and steel foreman William Tibbetts.

The Colorado Department of Highways was represented by resident engineer R. S. Tillson and party chief R. W. Walls. The project was under supervision of the Pueblo District, which has J. A. Solmonson as district engineer. The chief engineer of the Colorado department is Mark U. Watrous. THE END

Ford, Bacon & Davis move

The 65-year-old firm of Ford, Bacon & Davis, Inc., engineers and consultants, marked its anniversary in April by moving to new and larger quarters at 2 Broadway, New York City. The firm also maintains offices in Chicago and Los Angeles, and in Monroe, La., headquarters of its construction activities.



THAT'S THE MATTERHORN—or it will be soon. Being built to exact scale for Disneyland by the American Bridge Division of U. S. Steel Corp., the structure will be equal in height to a 14-story building. No two steel beams or girders are of the same length. Each member was fabricated to individually designated length in order to duplicate the irregular profile of the famous Swiss peak.

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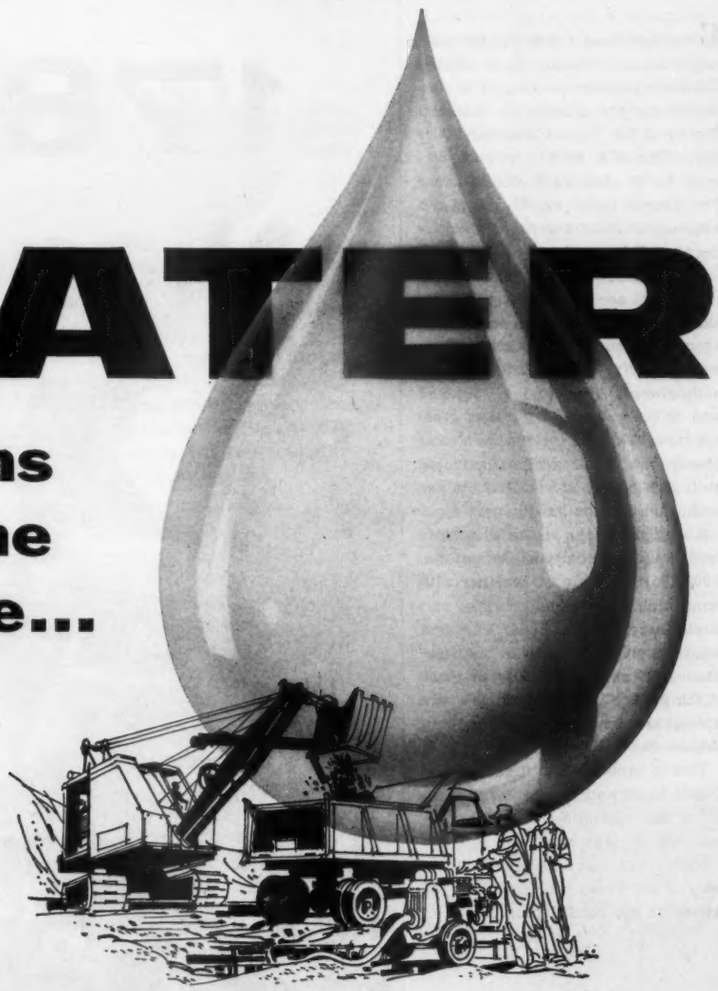
threatens
your time
schedule...



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The toughest bailing out jobs you meet up with in building roads—and keeping excavation dry—give you much less trouble with high-capacity Barnes pumps that move more water, faster!

You'll bail as much as 90,000 gallons an hour with Barnes *self-priming* centrifugal pumps. Handle semi-solid seepage more swiftly, too, using Barnes heavy duty diaphragm pumps. Wide selection. Rugged construction. Many designed for low cost job-to-job portability. Be sure to get a free copy of our new Construction Pump Selector No. 238. It helps you match up the right Barnes pumps with any liquid-handling problem you meet!

Specify Barnes Blue Ribbon Quality
... it pays off!

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BARNES MANUFACTURING CO.,
MANSFIELD, OHIO Dept. B-59 5705-9

For more facts, use Request Card at page 18 and circle No. 276

The Barber-Greene finisher working on the 8,000-foot-long taxiway that parallels the runway at Tucson Municipal Airport is fed by a White truck with a Utility 12-yard body. The truck hauls 17.5 tons of mix.

Special rigs prove their worth on

Construction of a new parallel taxiway, aprons, hangar, and related buildings provides a completely new facility for the Arizona Air National Guard at the Tucson Municipal Airport. The $2.6 million project was built by M. M. Sundt Construction Co., Tucson, under supervision of the Los Angeles District of the U. S. Army Corps of Engineers.

Included in the building area of the project are the hangar, a 3-story annex, motor service shop, supply and armament building, rocket storage building, crash-truck station, and underground 75,000-gallon jet-fuel and 25,000-gallon aviation-gas storage tanks. The area is served by a completely new water system, including well, 200,000-gallon elevated storage tank, and distribution piping.

To augment the existing landing facilities at the airport, a parallel 8,000×75-foot taxiway, together with connecting taxiways and parking and service aprons, was built. The new construction is tied in with the runways and taxiways already in place at the field so that both the new and the old can be used by military and civilian flights.

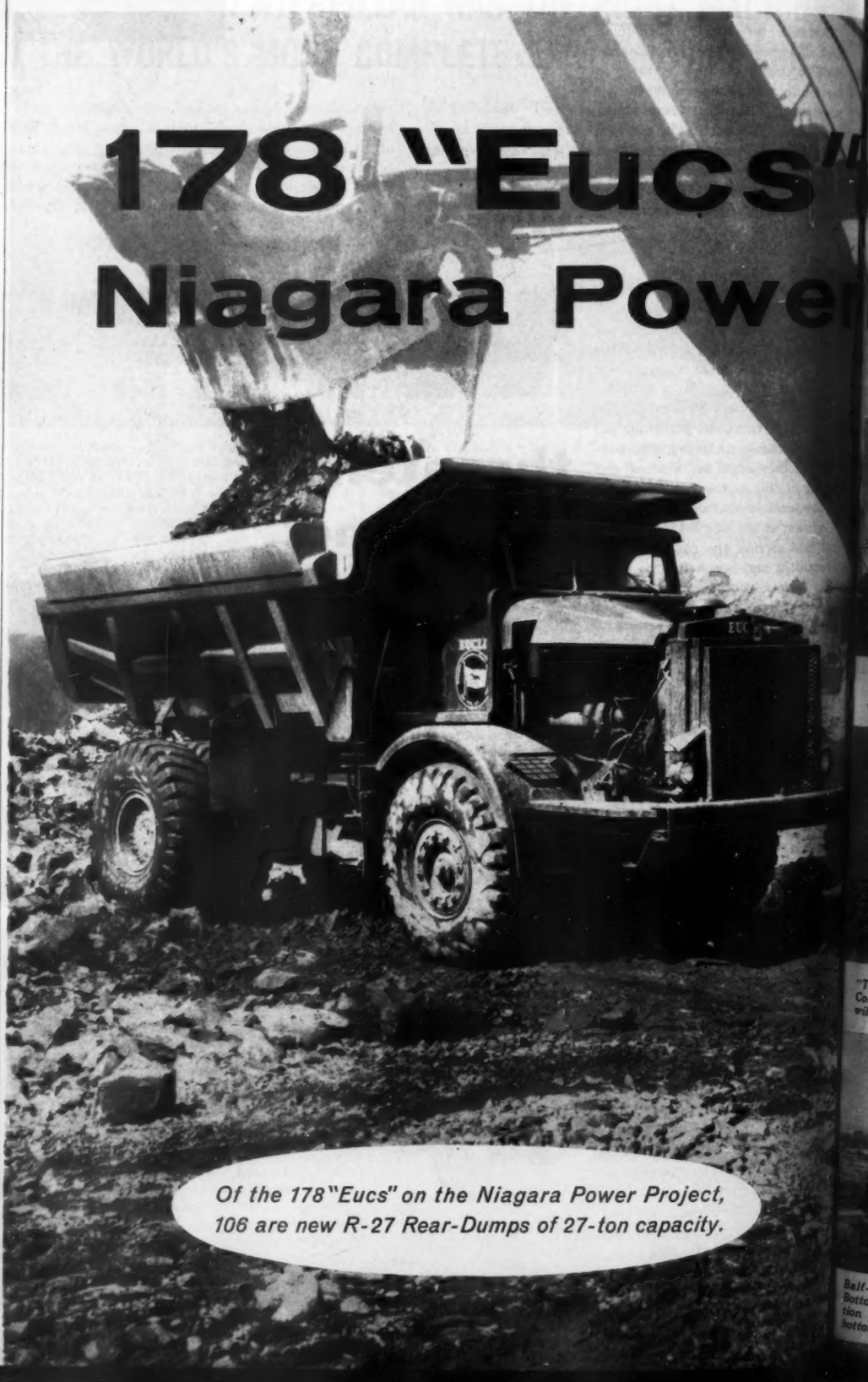
This is probably the first National Guard facility of this type in which all of the operational buildings except the hangar are fully air-conditioned. The installation includes a total of 162 tons of mechanically refrigerated air conditioning.

Extra rolling of the taxiway is provided by a Rosco self-propelled 10-ton 9-wheel rubber-tire roller. Heavy rolling compensates for the little kneading action the pavement will receive compared to that on heavily traveled highways.

Reinforced brick construction

The 273×150-foot hangar includes two 50×150-foot lean-to sections. This structure has a steel frame and trussed roof, furnished and erected by Allison Steel Mfg. Co., Phoenix, which used a Lorain 25-ton Moto-Crane for the job.

Exterior and most interior walls of the hangar, the adjacent 3-story annex, and most of the other structures in the project were built of reinforced brick. The exterior walls are of brick backed with concrete block. Interior walls are of concrete-block construction. The grout-lock design, with reinforcing steel at 16-inch centers horizontally and 32-inch cen-



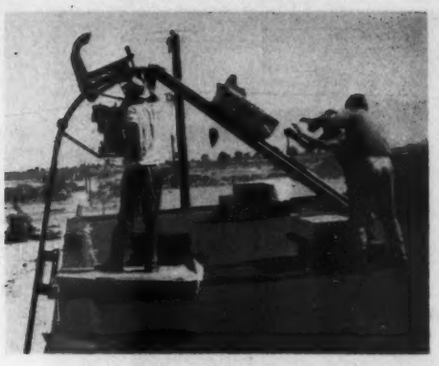
Of the 178 "Eucs" on the Niagara Power Project, 106 are new R-27 Rear-Dumps of 27-ton capacity.

Air National Guard project

ters vertically, eliminated the necessity for any header courses.

The masonry subcontractor, Ronald Lee of Tucson, used a number of mechanical devices to simplify and speed this phase of the work. All mortar was mixed at a central point and transported to the workmen in rectangular steel containers that could be picked up and carried by a fork truck. A Champ high-lift fork truck with a telescoping lift frame raised the buckets of mortar as much as 20 feet off the ground to serve workmen on scaffolds and on the second floors.

Blocks were cut to exact size and shape on a Felker masonry saw that employed abrasive blades. When crews worked off the ground, a Sam Mulkey elevator raised the brick and blocks to the working platform. A Tusky elevator handled wheelbarrows of materials to the third floor of the annex building.



A Roofmaster hoist, made by Roofmaster Inc., Los Angeles, delivers packages of roof insulation to the top of one of the buildings at the airport. Hangar, 3-story annex, motor service shop, and armament and rocket storage buildings were included in the contract.

The built-up roofs of the buildings were installed by Riggs Roofing & Supply Co., Tucson. Riggs' crews used a portable Roofmaster hoist to raise the rolls of roofing, packages of insulation, and other materials from the ground to the roofs.

The one structure of really different construction was the rocket storage building. This was constructed as a tilt-up structure, the 12-inch-thick walls being cast on the floor slab and then raised into place. The building has a light blowout roof. In case of an accidental explosion, the roof is expected to blow out, leaving the heavy concrete walls to protect adjacent structures and personnel.

Water system

One of the most spectacular construction items was the erection of the 200,000-gallon elevated water tank and its 125-foot-high tubular-leg tower. The tank was fabricated

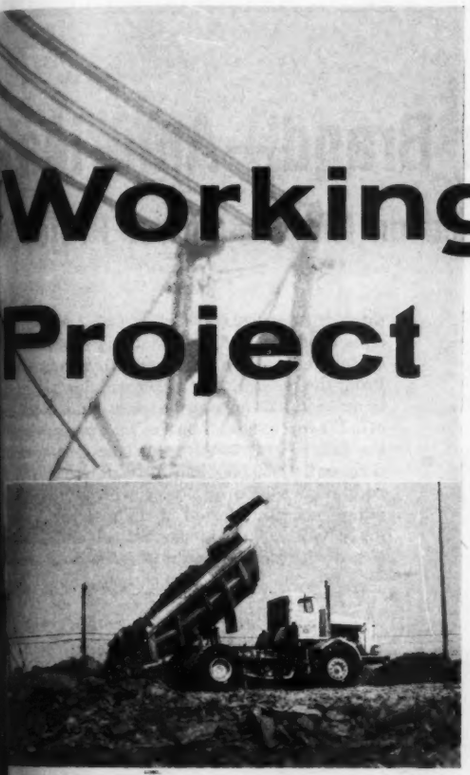
(*Continued on next page*)

A 100-foot-long basket pole with 32-foot hand telescoping jib stands ready to raise sections into place for the 200,000-gallon elevated water tank at the field. In the foreground, men work on the hoist that will raise materials to the hangar roof.

"Working on the Project

THE $625 million Niagara Power Project being constructed by the Power Authority of the State of New York is one of the world's greatest hydro-electric developments. When completed in 1962, the project will produce well over 2 million kilowatts of electricity from water that now flows unproductively over Niagara Falls . . . that's enough to supply the household needs of a city the size of Chicago —with over 3½ million population!

Consisting of five different sections, all phases of this tremendous job are now under contract. Although much of the work is still in the preliminary stage there are Euclids on every section—a total of 178 of them already! With many millions of tons of rock excavation to be moved, Rear-Dump "Eucs" predominate, but big Bottom-Dumps and "Twin" Scrapers are also being used. Contractors on 4 of the 5 sections have purchased a total of 106 new R-27 Euclids for their work. With 325 or 335 h.p. engine, 4-speed Torqmatic Drive, converter lock-up, and 18.00 x 25 tires all around, this new "Euc" moves 27-ton loads on steep grades and tough hauls.



Gull Contracting & L. G. Defelice are using 36 of these 27-ton "Eucs" on their 4½ million yd. channel excavation work.

"Twin" Scrapers in the Euclid fleet of Channel Constructors help remove overburden from rock that will supply the big aggregate plant.

Balf-Savin-Winkelman have Rear-Dump and Bottom-Dump "Eucs" in their fleet. Earth excavation for the two inlet channels is hauled in 12 bottom-dumps.

These contractors are using "Eucs" on all 5 sections:

Merritt-Chapman & Scott Corp.	64
Channel Constructors (Peter Kiewit Sons Co., Perini Corp., Morrison-Knudsen Co. Inc., and Walsh Const. Co.)	37
Gull Contracting & L. G. Defelice.	36
Edw. Balf Co., Savin Bros., D. W. Winkelman.	41

Euclid equipment has proved its ability to maintain high production at low cost for over 25 years . . . on big, rush projects like this one and on smaller mining and construction operations, too. For reasons why "Eucs" are *your* best investment see your Euclid dealer before you figure that next job!

EUCLID
Division of General Motors Corp.
Cleveland 17, Ohio

←For more facts, circle No. 277

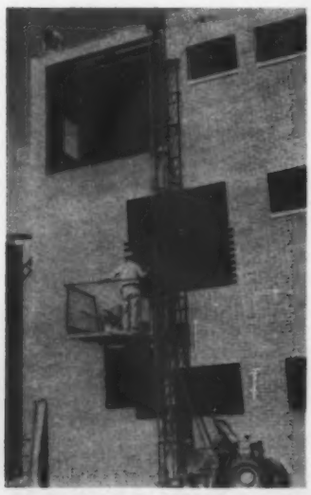
This Champ fork-lift, made by Champ Corp., El Monte., Calif., does a good job of raising mortar to workmen at the second-floor level of the 273×150-foot steel-frame hangar. The rig can raise a load 20 feet off the ground.

(Continued from preceding page)

and erected under a subcontract by Pittsburgh-Des Moines Steel Co., operating from the plant at Santa Clara, Calif.

The erection crew used a 100-foot basket pole with a 32-foot hand telescoping jib to raise the tower sections and tank sheets. The basket pole is so called because of the roller-bearing cases in which its top and bottom are mounted. The lower case starts at ground level and is carried up on four hanger cables as the tower rises. The guys from the top come down to hand winches located at the bottom of the legs. A 2-drum Skagit winch powered by a Waukesha engine furnished the hoisting power.

At the site, sections of the tower were assembled on the ground into units weighing as much as 3.5 tons. These sections were raised by the basket pole and held in place while workmen welded the joints. The legs and the tank were of all-welded construction. Welding current was supplied by a GM 160-kw diesel-powered generator. From this source as many as eight Westinghouse dc arc welders and an air compressor can be operated. On this job five 500-amp welders were used.



Crews working on the third-floor level of another new building are served by a Tusky elevator. A workman and wheelbarrow of materials are riding to the top floor.

As the tower was erected, the basket pole was raised with it until the jib projected above the top of the tower. Then the jib was extended and the line dropped down outside the tower to raise the tank sheets. The crew, ranging from 7 to 9 men, completed the tank in about five weeks.

To provide a supply of water, a 10-inch well was drilled to a depth of 400 feet. A Peerless vertical turbine pump raises the water from the well to the tank and distribution system.

Bituminous taxiway pavement

General contractor Sundt joined forces with Matich and Sundt to place 17,800 cubic yards of concrete for the parking apron, while M. M. Sundt's crews handled the 250,000 cubic yards of earthwork required for the grading, laid the base and bituminous paving, and produced all aggregates. The short-haul excavation was done by International TD-24 tractors and Cat scrapers assisted by Cat 12 graders. Long-haul excavation was by DW20's and D9 push-Cat. A 36-inch lift of select subbase was loaded from a pit by two Michigan tractor shovels and hauled with DW20 scrapers. These same rigs imported a 14-inch lift of 2-inch-maximum gravel over the subbase. The final lift

USS Tiger Brand—America's No. 1

—used on Niagara Power Project—Biggest

Niagara Falls is the greatest, single natural source of water power in North America. Soon it will be harnessed by the New York State Power Authority to produce 2,190,000 kilowatts of electricity. This is 216,000 more kilowatts than is generated at Grand Coulee Dam, the Free World's No. 1 manufacturer of hydroelectric power.

Water now tumbles over the falls at a rate of 200,000 cubic feet per second. To make use of some of this, two huge intake structures on the Niagara River above the falls will draw water into the power system. (See Map.) This water will pass through about 22,000 feet of twin, covered concrete conduits, feeding into a huge reservoir with a storage capacity of some 20 billion gallons. From the reservoir the water will flow by gravity to an 1840-foot-long power plant built at the base of a 314-foot rock cliff on the Niagara River, below the falls. Here, 13 huge turbine-generators will turn out 1,950,000 kilowatts of electricity. An additional source of power will be the small pump-generator station at the reservoir, generating up to 240,000 kilowatts. Shovels and bulldozers rigged with USS Tiger Brand Wire Rope are be-

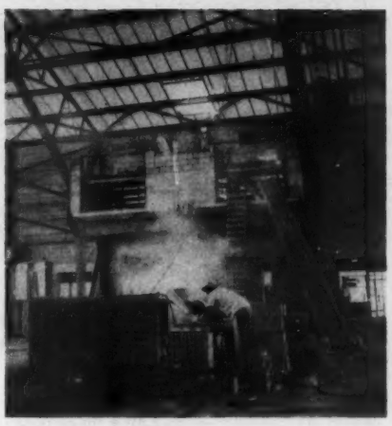
of base was a 6-inch course of minus ¾-inch crushed limestone, which was trucked in, spread, watered, and compacted to 100 per cent density.

The base was primed with MC-1, which was allowed to cure. A tack coat of RS-1 emulsified asphalt was applied ahead of the surface course. The bituminous surfacing consisted of a 1½-inch binder course with 1-inch-maximum aggregate and a 1½-inch surface course having ½-inch-maximum aggregate. Both courses were mixed with 85 to 100-penetration asphalt.

The mix was prepared in a Barber-Greene 948 plant set up on a more or less permanent location a short distance from the airport. At the plant, a Michigan 125A tractor shovel fed the four sizes of aggregate to the feed hoppers to be conveyed to the 160-ton-per-hour dryer. A hot elevator carried the aggregates to the gradation unit, where they were again separated into four compartments before being batched to the 5,000-pound pugmill.

The 100-ton asphalt storage tanks were heated by a Childers hot-oil heater fired with natural gas. The dryer was also fired with natural gas.

A fleet of big White trucks with Utility 12-yard dump bodies hauled the mix from the plant to the airport, delivering as much as 17.5 tons per load.



Concrete blocks for the exterior masonry walls of the hangar building are cut to shape with this Felker masonry saw that employed abrasive blades. The Sam Mulkey elevator, background, raises the blocks to men on the scaffold.

The mix was laid down by a Barber-Greene finishing machine and compacted by a series of rollers. The first pass right behind the laydown machine was made by a Huber 12-ton 3-wheel roller operating backward. In this way, the large rear wheels climbed up on the hot material, instead of the smaller front roller being pushed into it.

Succeeding passes were made by a Tampo self-propelled 14-ton 11-wheel rubber-tire roller, a Huber 12-ton tandem, and a Rosco 9-wheel 10-ton rubber-tire roller. This more-than-usual rolling was applied to meet rigid Marshall requirements for airfield pavements. The finished pavement, as well as each course of the base, was test rolled with a 60-ton roller.

Personnel

On the building construction, Walter Jarvis and C. H. McCormick were superintendents for M. M. Sundt Construction Co. C. R. McCall was carpenter superintendent. Ferris Ray served as superintendent of the earthwork and paving under the supervision of Sundt's assistant vice president Ronald Browne.

Representing the Corps of Engineers were project engineers A. B. "Al" Mattinger and Victor Buschmeyer, and assistant project engineer Jesse Brown. The district engineer of the Los Angeles District is Colonel C. T. Newton. THE END

After the mat for the new taxiway has been given an initial rolling, a Tampo self-propelled 14-ton 11-wheel roller swings into action. This was one of four rollers used to bring the pavement to Marshall requirements.

←For more facts, circle No. 278

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For complete information, write to American Steel & Wire, Dept. 917, 614 Superior Avenue, N.W., Cleveland 13, Ohio.

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Main generating plant of the Niagara Falls Power Project, one of the world's largest, will produce 1,950,000 kilowatts of electricity.

Ripping rock—USS Tiger Brand Wire Rope is used throughout this shovel and on many of the other draglines, cranes and bulldozers digging the excavation for the main power plant.

Engineering Consultants:
Uhl, Hall and Rich—Boston

General Contractors:

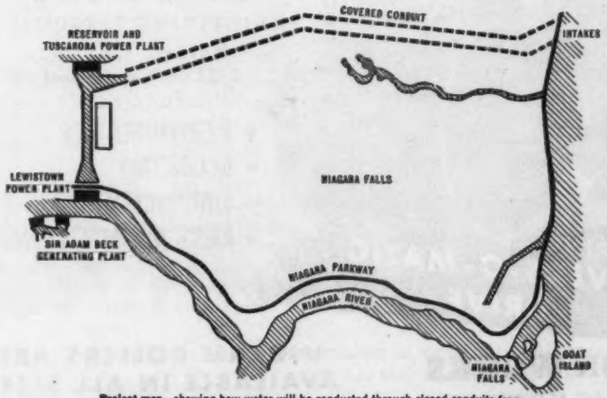
Merritt Chapman & Scott—
$98,288,498 Niagara Power Plant and $65,692,254 Niagara River Intake Works, plus 6600-foot section of the waterway.

Gulf-Davis-Winkelman—
$37,366,805 Section II of the waterway.

Gulf-Delaflex—
$29,861,840 Section III of the waterway.

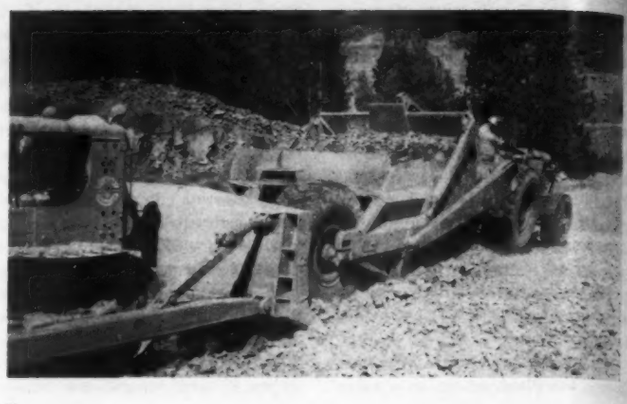
Tuscarora Contractors—
Combine of Arundel Corporation, Sponsor
L. E. Dixon Company,
Hunkin-Conkey Construction Company,
$39,834,292 Tuscarora Power Plant.

Channel Constructors—
Peter Kiewit, Sponsor
Perini Corporation
Morrison-Knudsen
Walsh Construction Company
$31,855,000 Section IV of the waterway, plus Aggregate Plant.



Project map—showing how water will be conducted through closed conduits from intake above the falls to storage reservoir and then to the main power house below the falls. The two power plants will generate 2.19 million kilowatts of electricity—enough for the household needs of a city the size of Chicago.

A DW20 scraper, pushed by a Cat D9, picks up a full load of minus 8-inch rock required for the Zone II material for Howard Prairie Dam near Ashland, Ore. Blasting in this area, just 500 feet from the dam site, broke rock down to a size that scrapers could handle.



Scrapers handle 8-inch rock for dam project

Discovery of a source of rock within 500 feet of the dam site was a bonanza for R. A. Heintz Construction Co., Portland, Ore., during the construction of Howard Prairie Dam, an element of the Bureau of Reclamation's Talent project near Ashland, Ore. The contractor really capitalized on the find by loading and hauling the shot rock with scrapers.

On this particular project, the saving of even a small amount of time was extremely important. Although the $1,074,345 contract provided 750 days to complete the dam, Heintz knew at the start that he actually had only one short season to bring the earth-and-rock structure up to a sufficient height to prevent overtopping by spring floods. Failure to accomplish this would mean probable overtopping and extensive damage to a partially completed structure.

Howard Prairie Dam is essentially a rock-fill structure with a compacted clay core. It closes the outlet to a mountain valley, creating a reservoir to store water for the Green Springs power plant and for irrigation.

The structure is 1,154 feet long and attains a maximum height of 105 feet above its bedrock foundation. The impervious central core is built up of 170,000 cubic yards of compacted clay. On both sides of the core is a minimum of 15 feet of Zone II rock, graded from 8-inch down. Upstream and downstream sections of Zone III material required 190,000 cubic yards of larger rock to complete the structure.

The outlet works on the right abutment consist of a 3-foot circular concrete conduit leading to an emergency gate valve in a gate chamber at about the midpoint of the dam, and then a 30-inch steel pipe leading to a control valve in the control house at the toe of the dam. The 30-inch-size pipe runs through a 6-foot 6-inch horseshoe-shaped concrete passageway that gives access to the emergency valve. An uncontrolled spillway on the left bank provides for the release of excess water from the reservoir. There was provision for only partial diversion during the construction period, and, since the outlet works are unable to handle the maximum runoff during winter and spring, it was almost imperative to bring the structure up above possible reservoir flood level in one season.

Preliminary operations

As soon as clearing permitted, crews

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• ECONOMICALLY
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GORDON SMITH & COMPANY, INC., 483 College St., Bowling Green, Ky.

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TANDEM AND 3 WHEEL

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Equipment uses downhill loading for short, fast loading cycle; two 9-hour shifts complete most of embankment in two months

started stripping the dam foundation down to bedrock and excavating for the structures. These were a combination of scraper and dragline operations.

The contract provided for the drilling of some 8,000 feet of hole, ranging to 110 feet in depth, and the placing of 11,000 sacks of grout to seal the underlying rock against seepage. This portion of the work was sublet to Lynch Bros., Seattle, Wash. Since the underlying rock was found to be very good, the actual drilling and grouting quantities were less than anticipated.

Next in the sequence of operations came the construction of the outlet works. Job-built forms were set and moved with the aid of a Northwest Model 25 crane. Concrete was produced on the site, delivered by two 4-yard Dumpcretes on Studebaker and Diamond-T trucks, and placed by crane and Gar-Bro buckets.

The concrete plant was set up to take advantage of a steep slope adjacent to the right abutment. A CMC 3-compartment 27-yard bin was fitted with an inclined screen to remove fines from the coarse aggregates. A Wagner Scoopmobile with a 1-yard bucket charged the bins, and the material was delivered to the site by truck.

The aggregates and sack cement were fed to the skip of a 34-E paver, which discharged the wet batches into the Dumpcretes.

Build embankment in two months

With the preliminary work finished, the contractor — with luck — had slightly more than two months left before fall rains ended the construction season. Heintz put on two 9-hour shifts working 6 days a week, and had the dam up out of the danger zone before rains stopped the work.

Clay from a nearby borrow pit was delivered by a spread of 4 Cat DW20 scrapers push-loaded by a D9. Material dumped on the embankment was spread by a D6 tractor-dozer and watered by a DW10 tractor carrying a 4,500-gallon water tank. A D8 with a heavy sheepsfoot roller provided the compaction, while an Allis-Chalmers HD-5 tractor with an International Harvester disk kept the surface loose for good bond between courses.

As the embankment was started, water flowing in the creek was diverted to one side. Then the creek was diked, and two vertical turbine pumps were installed to pump the

(*Continued on next page*)

Clay for the core of the dam is unloaded, left, by a DW20 while an A-C HD-5 tractor pulls an International Harvester disk to keep the surface loose for a good bond. A D8 pulls a sheepsfoot roller compacting the material. At right, an Allis-Chalmers HD-16 pushes Zone 111 rock into place. Concrete structures are for the outlet works.

WHY? Ford Engines are tough! Ford Service is everywhere!

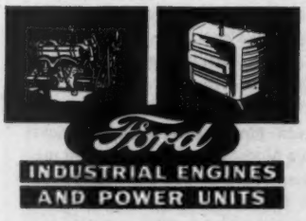
Ford Industrial Engines are becoming the solid favorite on construction jobs everywhere—primarily because of their many durability features.

You'll find, for example, that every Ford Engine has Short Stroke design that cuts engine friction, reduces wear . . . deep-block construction that minimizes vibration, lengthens bearing life . . . and overhead-valve design for greater operating efficiency and economy.

Ford Engines range from 134 to 534 cubic inches . . . including two modern Ford Diesels and three Super Heavy Duty V-8's—*all* available as power units or complete engine assemblies. To meet special fuel needs, gasoline engines can be adapted to LP- or natural gas.

As a Ford power user you need never concern yourself about costly downtime . . . for there's always a Ford Dealer nearby to give you the service you need *when you need it.*

Little wonder more and more profit-minded operators are swinging to Ford every day. For original installation or re-powering, specify Ford Industrial Power.



INDUSTRIAL ENGINE DEPARTMENT • FORD Division of FORD MOTOR COMPANY
P. O. Box 598, Dearborn, Michigan

YOUR JOB IS WELL-POWERED WHEN IT'S FORD-POWERED!

For more facts, use Request Card at page 18 and circle No. 281

A Euclid end-dump unloads coarse rock for the Zone 111 area as the clay core is being built up, background. Work on the embankment was done 18 hours a day, and there was virtually no lost time during the two months spent on this phase of the project.

(*Continued from preceding page*)

water in pipes across the dam site. A Cat diesel generator unit provided power for the 20-hp electric motors driving the pumps.

Because nearly two-thirds of the volume of the structure was included in the two zones of rock, quarrying, delivery, and placing of the rock were the contractor's prime concern.

Scrapers handle rock

The contractor's best break on the job came with the accidental discovery that the knoll practically adjacent to the right abutment of the dam contained a rock deposit tailor-made for Zone II. He had previously planned to haul this material in from a quarry some distance up the reservoir.

Using a Joy 4-inch drill mounted on a D8 tractor that also carried a Joy 600-cfm compressor, the contractor drilled the area on a 16×16-foot gridiron pattern to a depth of 36 feet. The holes were loaded with a combination of Atlas 40 per cent dynamite and nitro-carbo-nitrate, then detonated with Primacord.

The shots not only broke the rock down to minus 8-inch size to meet the Zone II grading requirements but also left it in condition so that it could be loaded directly by scrapers. Taking advantage of the hillside for downhill loading, the DW20 scrapers, pushed by the D9 tractor, got full loads on a very short and fast loading cycle.

Larger rock for Zone III was quarried about half a mile upstream at the edge of the reservoir area. Here, a Gardner-Denver Air Trac drill and an Ingersoll-Rand Crawl-IR drill, using 12-foot steels, pounded out 3-inch holes on a 10×10-foot gridiron pattern. A Chicago Pneumatic 900-cfm Power Vane compressor supplied both drills. These holes were loaded with a 50–50 mixture of Atlas dynamite and fertilizer and were fired with Primacord.

This rock was loaded by a new Lorain Model 85A 2½-yard shovel and a Model 6 Northwest ½-yard machine. Three Euclid end-dumps and two Mack B-66 10-yard trucks delivered the rock to the embankment. An Allis-Chalmers HD-6 tractor-dozer spread and compacted the courses as rock was dumped.

With Caterpillar and Kohler generators supplying power for night lighting, the work continued 18 hours per day with practically no lost time until the embankment was successfully brought up to within 39 feet of the crest elevation.

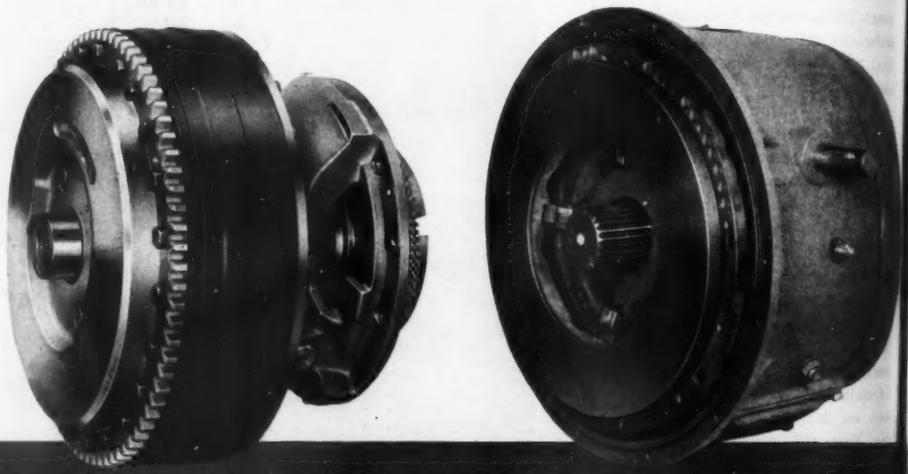
Water crosses divide twice

It is of interest to note two related projects that are also elements of the Talent project. One is a 6-foot horseshoe tunnel extending 3,700 feet through the mountain that forms the divide between two watersheds. This tunnel and the connecting canals will bring water from another watershed into the Howard Prairie Reservoir.

The tunnel was constructed under a $426,000 contract by Lord Bros., Contractors, Portland. The contractor drilled 8-foot rounds using Copco drills and jacklegs, and mucked with

Twin Disc Single-Stage Torque Converter

Twin Disc Three-Stage Torque Converter



The drive that's best for push-loading is best for *any* job . . .

You're probably familiar with the way torque converter drives smooth out the shocks and speed up the work cycles on push-loading operations. Equally impressive is the torque converter's performance on other heavy-duty crawler jobs.

"Fluid flexibility" is the key to torque converter superiority. In a mechanical drive there's no "give" under the impact of shock loads . . . every moving part is caught in the unyielding grip of steel against steel. A torque converter drive, on the other hand, is actuated by *fluid* which soaks up shocks and vibrations before they can reach moving parts. As a result, engines and equipment last longer with far less maintenance.

But that's not all. Torque converters have the unique ability to *multiply* torque whenever extra power is needed. The ratio between torque output and input is increased instantly and automatically (up to 6:1 in Twin Disc Three-Stage Converters; 3:1 in Single-Stage units) to overcome load resistance quickly and smoothly. Lugging and stalling are eliminated without increasing engine rpm. Since the converter matches power to load demands automatically, there's no need for clutching or shifting . . . a tremendous advantage in terms of operator efficiency and productivity.

Torque converter drives are standard on Allis-Chalmers and optional on Caterpillar and International Harvester track-type tractors. All three standardize on Twin Disc components when torque converter drive is specified. For more work output and more profit . . . *on every job* . . . make sure your next crawler is equipped with a Twin Disc Torque Converter.

TWIN DISC CLUTCH COMPANY, RACINE

Eimco muckers and by hand into Getman Bros. 1-yard Scoot-Crete buggies that transported the muck to the dumps.

Downstream from the Howard Prairie Reservoir is another element of the Talent project. This is the Howard Prairie delivery canal. This canal, meandering through the mountains, will eventually terminate in another tunnel that will carry the water back through the divide into the same watershed in which it originated.

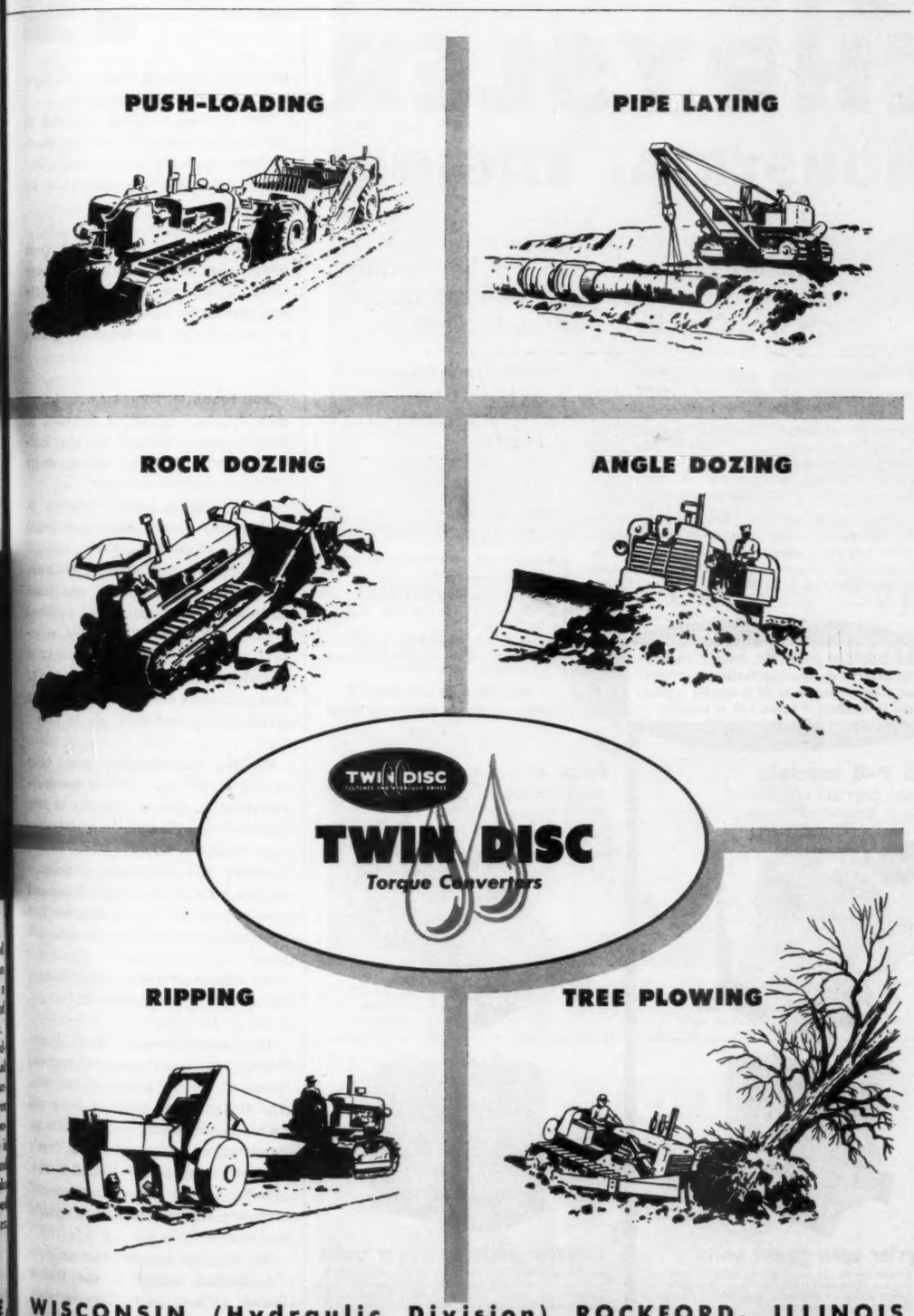
The additional storage and control obtained through these projects makes feasible the Green Springs power plant with its 8,600-foot penstock.

Supervision of construction of the big Talent project for the Bureau of Reclamation was handled by construction engineer J. A. Callan, assistant construction engineer John Hatch, and office engineer Francis O'Connor. On the Howard Prairie Dam and adjoining projects, Wayne Johnson was resident engineer for the Bureau. Assistant resident engineer James Graham looked after the dam and tunnel contracts, while assistant resident engineer Earl Wick supervised the delivery-canal job and reservoir-clearing contract.

Work for R. A. Heintz Construction Co. on the Howard Prairie Dam was supervised by superintendent Dean Johnson, assistant superintendent Earl Farmer, excavation foremen Al Beum and A. L. Klingbeard, and master mechanic Pat Daugherty.

THE END

This Ingersoll-Rand Crawl-IR mounting an I-R wagon drill pounds out 3-inch blast holes in the quarry supplying Zone 111 rock. A Chicago Pneumatic 900-cfm compressor supplies air.



WISCONSIN (Hydraulic Division) ROCKFORD, ILLINOIS

For more facts, use Request Card at page 18 and circle No. 282

London skyscraper to be one of Europe's tallest

London's proposed new skyscraper, estimated to cost about $14 million, will be the highest office building in Britain and one of the tallest in Europe. To be built at Millbank, Westminster, it will consist of three main blocks: a 31-story tower block some 370 feet high; an 8-story Y-shaped block 90 feet high; and an 11-story residential block 120 feet high. Approximately 350,000 square feet of office space will be provided.

The foundations of the buildings will rest on 500 bored cylinder piles, those supporting the tower penetrating 90 feet into the London blue clay. Reinforced concrete will be used in all buildings; and the office blocks will be covered with a specially developed prefabricated curtain wall, the framing of which will be faced with stainless steel.

The division of office space is flexible to the extent allowed by the basic module of 4 feet 3 inches. Floor-to-floor heights are 10 feet 9 inches, giving a clear floor-to-ceiling height of 9 feet on all upper floors.

The project is planned for completion by early 1963.

Apartment houses to have framework on the outside

Five apartment buildings, to be erected by the New York City Housing Authority, will have their skeletons on the outside. By putting the supporting columns on the outside of the buildings, wall space in the rooms will not be broken by uprights. The reinforced-concrete columns will be sprayed a light gray to form a part of the buildings' exterior design. Building facades will be aluminum panels and light-red brick.

The 22-square-inch supporting columns will be set to a depth of 10 inches in the exterior walls. The 22-inch-wide concrete panels, projecting one foot from the faces of the buildings, will be spaced 10 feet 4 inches apart. There will be 23 such uprights around each building.

Two of the buildings will be 22 stories high; the other three, 18 stories. All are located in the East Harlem section of New York City.

Manufacturers' memos

Sam DuPree, vice president in charge of production of **The Goodyear Tire & Rubber Co.**, Akron, Ohio, has been elected to the board of directors. He succeeds **R. S. Wilson**, former executive vice president, who has retired.

The company has named **Ben M. Stephens** manager of the molded and extruded rubber and plastic products plant at St. Marys, Ohio. He succeeds **A. A. Teisher**, who has retired after 43 years of service. **Daniel R. Remigio** replaces Stephens as manager of the rubber belting plant in Lincoln, Nebr.

The firm's Metal Products Division has appointed **C. D. Thompson** regional sales manager at Chicago to direct field activities of the company's representatives there and in Milwaukee and Detroit. **R. O. Bowersox** has been named manager of wheel sales; **D. E. TeLinde**, senior sales correspondent; **A. R. Wilson**, a member of the sales staff in the wheel and service sales department; and **J. L. Harsha**, staff member of original equipment sales.

M. Scott Dickson, an engineer of the Industrial Division of **W. & L. E. Gurley**, Troy, N. Y., has been elected vice president of the company. Before joining the firm, Dickson was associate professor in the department of military topography and graphics at the U. S. Military Academy at West Point. He held the rank of colonel.

M. Scott Dickson, vice president of W. & L. E. Gurley.

The Noble Co., Oakland, Calif., has appointed **Van Barber** Southwest regional sales manager of the batching-plant division in Los Angeles. **Larry Taylor** has been named sales executive in the automation division with headquarters in the home office.

The engine sales department of the Construction Equipment Division, **International Harvester Co.**, Chicago, has appointed **R. R. McKiel** assistant manager. **A. W. Meyer** takes over McKiel's former post as supervisor of manufacturer sales; and **N. G. Esbrook** is the new supervisor of sales promotion. **L. E. Muzzy**, former head of the replacement engine section, is now supervisor of distributor sales.

R. E. Burton has been promoted to president and general manager of the **Buffalo-Springfield Division, Koehring Co.**, at Springfield, Ohio. He was previously assistant director of marketing for the parent company.

R. E. Burton, president and general manager of the Buffalo-Springfield Division of Koehring Co.

The division is being enlarged to include the operations of the Stardrill-Keystone Co., Beaver Falls, Pa., which was recently purchased by Koehring.

Quentin Keeny has joined **Dust Suppression & Engineering Co.**, Lake Orion, Mich., as sales manager. He was previously with the process development staff of General Motors Corp.

The Frank G. Hough Co., Libertyville, Ill., has appointed **Herman E. Brown** sales manager of the Payloader Division. Brown was formerly Western regional manager.

At the same time, **Kenneth B. Larkin** was named Eastern regional manager; **Robert L. Knox**, Central regional manager; **Donald O. Ross**, Western regional manager; and **Bruce C. Dennett**, assistant to the regional managers. **Charles J. Bernard**, manager of the order and distribution department, assumes direction of manufacturers export sales as well as scheduling operations.

Charles M. Mayhew has been elected a director of the **Gardner-Denver Co.**, Quincy, Ill. He is vice president of the Mayhew Machine and Mayhew Supply Cos., Dallas, producer and distributor of seismograph, geophysical, petroleum, and construction drilling equipment. The firm joined Gardner-Denver late last year.

All officers and directors of Gardner-Denver were re-elected.

H. P. Zandbergen and **D. W. Whittington** have been appointed regional managers for the Industrial Division, **The Oliver Corp.**, Chicago. Both will have headquarters in Cleveland. Zandbergen will cover the firm's Eastern region in the United States, plus the eastern Canadian provinces, including the eastern half of Ontario and Quebec.

Whittington has been assigned to the Central region in the United States, as well as the provinces of central Canada, including Manitoba.

CHRYSLER
INDUSTRIAL ENGINES

here's why more and more manufacturers and owners of heavy-duty equipment are powering with big output, low cost Chrysler Industrial Engines.

1. Greater endurance: Chrysler Industrial Engines are high-speed, heavy-duty power plants built to stand up under the toughest jobs.
2. Greater efficiency: Chrysler Ind. 56A, for example, has oversquare, short-stroke design that cuts friction loss to a minimum; hemispherical-design combustion chambers produce more power with less heat loss.
3. Greater adaptability: Chrysler Engines can be tailored to your individual requirements with Chrysler optional equipment. All are available as open or closed power units; operate at full efficiency on gasoline, natural or L-P gas.

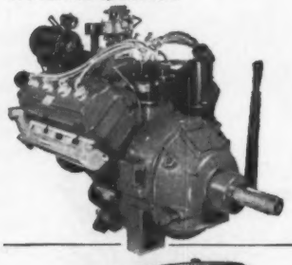
OPTIONAL EQUIPMENT AVAILABLE ON CHRYSLER INDUSTRIAL ENGINES

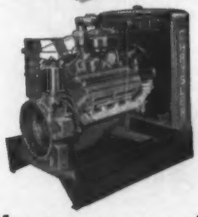
- Chrysler Torque Converter
- Corrosion and Fungus Resistant Electrical System
- Fluid Coupling
- Heavy-Duty Over-Center Clutch and Power Takeoff
- Mechanical or Velocity Governor
- Radio Shielding (24 volt)
- 3, 4 or 5 Speed Transmission
- Propane or Natural Gas Burning Carburetors
- Heavy-Duty, Oil Bath Air Cleaner
- Safety Switches (Low Oil Pressure, High Water Temperature)

NEW CHRYSLER INDUSTRIAL ENGINE PRODUCT LINE CATALOG enables manufacturers to "build" and price an engine to fit a specific application—in a matter of hours. Call or write.

INDUSTRIAL ENGINE DIVISION
CHRYSLER CORP., DETROIT 31, MICH.

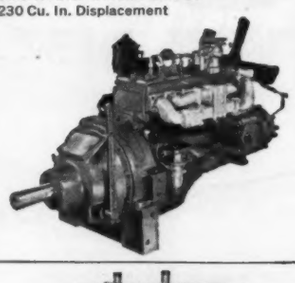
two V-8 models
SHOWN: CHRYSLER IND. 56A
354 Cu. In. Displacement





Chrysler open power units
Open power units for all engines include complete engine, plus skid base, fuel tank, radiator, instrument panel—complete with instruments—mounted on flywheel housing.

four in-line 6 models
SHOWN: CHRYSLER IND. 31
230 Cu. In. Displacement



Chrysler enclosed power units
Enclosed power units have complete engine, fuel tank, storage battery, instruments and instrument panel, flywheel, flywheel housing, skid base and completely enclosed sheet metal.

For more facts, use Request Card at page 18 and circle No. 283

Saskatchewan, and the western half of Ontario.

Former regional manager **H. E. Kruse** has been promoted to the newly created post of product training manager of the division.

Gordon N. Dow, general manager, and R. Rex Hartup, general sales manager of Leschen Wire Rope Division, H. K. Porter Co., Inc.

Gordon N. Dow has been named general manager, and **R. Rex Hartup**, general sales manager of **Leschen Wire Rope Division**, H. K. Porter Co., Inc., St. Louis, Mo. Dow, who was formerly general sales manager, now takes over full responsibility for the operation of the division.

Hartup, who joined the firm at the beginning of last year, was previously district manager of the Southeast district. He is now in charge of sales for all Leschen products.

The **T. L. Smith Co.**, Milwaukee, has elected **William A. Clayton** to the board of directors. He is vice president and director of sales for the company's complete line of truck, industrial, stationary, and portable mixers.

The firm also appointed **Leonard E. Broberg** vice president in charge of engineering.

Jack A. Hasten has been promoted to supervisor of the track-type tractor section of sales development by the **Caterpillar Tractor Co.**, Peoria, Ill. For the past two years he has been district representative in the central sales division.

"Quick-Way" Truck Shovel Co., Denver, Colo., has elected **Robert C. Finkelstein** president; **Gilbert S. Rigden** executive vice president; **Walter O. Lampl** vice president; **Henry L. Heymann** secretary; **John E. Gorsuch** assistant secretary; and **David E. Bright** treasurer.

Earl D. Pruess has been named field engineer for the Construction Machinery Division, **Clark Equipment Co.**, Benton Harbor, Mich. He will give sales assistance service in the application of Michigan construction machinery; and will engage in field studies of machinery to determine capabilities and performance and compile engineering data concerning on-the-job use.

C. A. Pickett has been promoted to manager of the Merchandise Division of **American Air Filter Co., Inc.**, Louisville, Ky. Formerly manager of field sales administration, Pickett will now be responsible for coordinating the integration, development, and growth of the marketing activities of all AAF product lines. He will work out of the home office.

For more facts, use coupon or circle No. 284→

William A. Smetts has been appointed manager of industrial relations for **The Thew Shovel Co.**, Lorain, Ohio. He was formerly a director of personnel at several plants of The American Machine & Foundry Co.

Enrique Enciso has been named Mexican sales manager for **Hawkeye Products Corp.**, Syracuse, N. Y. From Mexico City headquarters, Enciso will be responsible for sales of the company's demountable, portable elevators, which are used for transporting material and personnel at construction sites or where maintenance jobs must be performed at high levels.

R. H. Danford has been named district representative for the western area by the **Parsons Co.**, division of Koehring Co., Newton, Iowa. He will work out of San Francisco, covering Washington, Oregon, California, Arizona, Nevada, Montana, Idaho, Utah, Wyoming, Colorado, New Mexico, and the Panhandle of Texas.

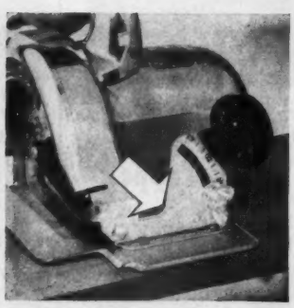
Donald F. Hastings has been promoted to district manager in Moline, Ill., for **The Lincoln Electric Co.**, Cleveland. Donald G. Wright takes over Hastings' former post as welding engineer in the San Francisco branch.

Adolph A. Karrasch has been named director of manufacturing for **Hercules Motors Corp.**, Canton, Ohio. For the past 22 years, Karrasch has been with International Harvester.

Dave M. McCullar has been appointed manager of passenger-tire sales and **Dairl W. Claxton**, manager of truck-tire sales for the Kansas City division of **The General Tire & Rubber Co.**, Akron, Ohio. **Shelley P. Jones, Joseph L. Bunker,** and **William R. Edmonds** have been named managers of truck-tire sales for the Chicago, Los Angeles, and Boston divisions, respectively.

New Black & Decker Super-Service Saws beefed-up to take on your toughest jobs!

NEW RUGGED SHOE DESIGN built to take the abuse of continuous heavy-duty sawing—gives firm footing for improved accuracy!



IMPROVED BRACKETS give increased quadrant setting accuracy; less variation on angle of saw blade to shoe surface; greater accuracy of cut.

PICTURE WINDOW in housing gives you top visibility. New air flow blows sawdust clear of job, clear of your eyes!

NEW POWER—cooler running B&D-built motors custom engineered for tough sawing jobs, continuous operation.

B&D Super-Service Saws bring new accuracy, new convenience to your work

On-the-job tests prove B&D Saws outcut, outperform, outlast other builder saws—with power to spare! Now, Black & Decker brings you a new, even more rugged series of saws built to stand the toughest gaff!

You'll find greater accuracy, a new guard retractor lever, better visibility—features you'll really appreciate when you see them. Available in 6½", 7¼", 8", and 9¼" sizes—each complete with carrying case and rip fence. Mail coupon for a free demonstration or additional information. THE BLACK & DECKER MFG. CO., Dept. 1308, Towson 4, Md. (In Canada: Brockville, Ontario.)

Leading Distributors Everywhere Sell

Look Under "TOOLS-ELECTRIC" in Yellow Pages

Black & Decker®

Quality Electric Tools . . . Power-built for top performance

MAIL TODAY FOR FREE DEMONSTRATION

THE BLACK & DECKER MFG. CO., Dept. 1305, Towson 4, Md.

☐ Please arrange a demonstration of your Super Service Saws.

☐ Please send additional information.

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

In the 120-foot-deep cut on Colorado 285, a Euclid scraper is push-loaded by an Allis-Chalmers HD-21. A Cat DW20, background, is leaving the cut with a load, while a Cat No. 12 grader keeps the road crossing at the end of the cut open for traffic.

Scraper spread attacks one side of 120-foot-deep cut while shovel and trucks excavate rock from other side • • •

One big rock cut worked from both sides with two different methods

Slicing through one big rock cut was a major part of a $448,000 grading job on Colorado 285 near Bailey. Z. H. Lowdermilk of Englewood, Colo., shot the rock and then excavated it with a scraper spread, and with a shovel and end-dump Euclids.

This 2.15-mile grading contract provides a new road part of the way down Crow Hill leading into the town of Bailey. In these parts, Crow Hill is well known as a difficult climb; in years past it taxed some cars to the last ounce of effort.

The new highway is actually the third road to be built up Crow Hill. The first, built early in the century, was a narrow winding trail with many switchbacks and innumerable sharp curves. At one point a space was provided where vehicles without vacuum tanks could turn around to back up a steep grade.

In 1927–28, the Colorado Depart-

Look at the uniform triple-lap coverage and straight edges you get with a "Black-Topper"

You can see the results of Etnyre's exclusive triple-lap coverage (spray from each nozzle overlapping *two* other sprays) in the unretouched photograph above. Road builders have learned that single-lap coverage is utterly unsatisfactory . . . double-lap coverage somewhat better . . but triple-lap coverage is the complete answer to hitting rough aggregate from all possible angles for complete coverage.

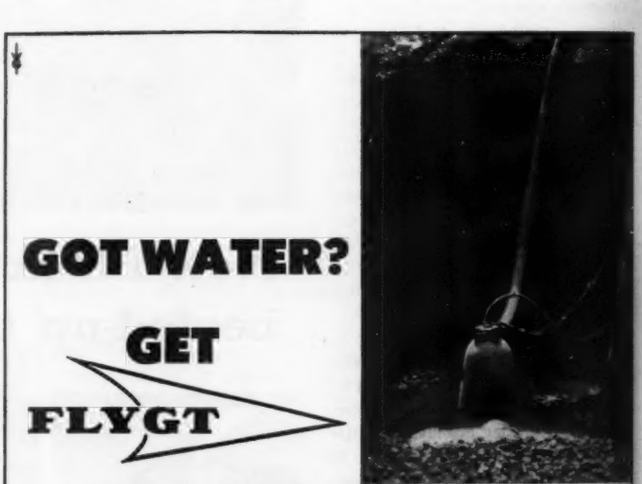
Moreover, by turning the end nozzle as indicated, you get a sharp line edge which adds the finishing touch to the job. With this accurate alignment, you can spray right up to the edge of curbs. Such dependable operation and uniform, accurate distribution are typical results you can expect from an Etnyre. Investigate today — find out how soon a "Black-Topper" can be delivered to you to handle your work faster, better, more economically!

E. D. Etnyre & Co., Oregon, Illinois

SEE YOUR ETNYRE DEALER

ETNYRE
"Black-Topper"
BITUMINOUS DISTRIBUTORS

For more facts, use Request Card at page 18 and circle No. 285



GOT WATER?

GET FLYGT

. . . THE 24-HOUR PUMP

Reasons for the world-wide success of FLYGT B-80L pumps:

Electric, fully submersible, fully portable (185 lbs)
Instant pumping — no priming, no installation
Runs dry without damage
Takes high proportion of solids
Practically no maintenance or supervision
Frost- and fire-proof
6 hp, 3" hose, 330 GPM, max. head 170 ft.

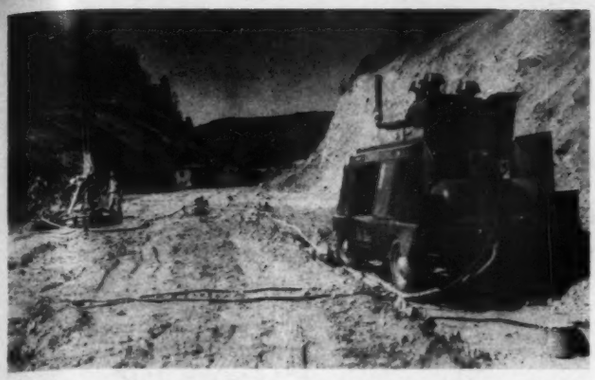
Also: *FLYGT B-38L — 1.8 hp, 75 GPM, 70 lbs, max. head 90 ft., 1½" hose; FLYGT B-80 Marine—6 hp, 330 GPM, max. head 145 ft., 3" hose; FLYGT B-150/200L — 65 hp, 3,000 GPM, max. head 220 ft., 6" or 8" hose, 1200 lbs. Higher heads with FLYGT pumps in tandem.*

FLYGT

WEST OF THE MISSISSIPPI:
Stancs MFG. & SALES INC.
(Corner of Olympic & Ninth)
Santa Monica, California.

EAST OF THE MISSISSIPPI:
STENBERG MANUFACTURING CORPORATION
Hoosick Falls, N.Y.

For more facts, use Request Card at page 18 and circle No. 286



A Worthington Blue Brute 600-cfm rotary compressor supplies a Gardner-Denver Air Trac with air on the east side of the cut, where a truck-and-shovel operation is used. The shovel loads rock while the drill sinks 3½-inch holes 6 feet deep for the final lift of excavation.

The shot rock is not easy to load, but with help from the Allis-Chalmers HD-21 push-tractor, this Euclid's bowl is being filled. Of the 398,000 yards of excavation for this job, approximately 100,000 yards was concentrated in the deep cut.

ment of Highways built a new road up the steep hill. It was the last word in mountain roads, and the builders thought another would never be needed. It was built by blasting out a bench in the rock hillside to provide better grades and curvature. But it goes several miles out of the way and by modern standards is far too steep and crooked.

The newest road slashes through the top of the hill in a rock cut 120 feet deep, crosses a deep gulley on a 60-foot-high fill, and then drops down toward Bailey on a straight 7 per cent grade with seven easy curves. Another 2 miles of heavy grading plus an additional 1.4 mile of paving, done by the same contractor under a $521,276 contract, carried the new road into Bailey at the bottom of the big hill. This new route cuts the trip by at least 4 miles.

Before grading got under way, the contractor cleared the entire right-of-way, using Homelite chain saws and tractor-dozers. Drainage culverts were installed, the largest being of 60 and 36-inch diameters. Both run 250 feet under the two largest fills.

A scraper spread consisting of two Euclid 6-wheel scrapers and a Cat DW20, together with an Allis-Chalmers HD-21 tractor-dozer and Cat D8 and D9 tractor-dozers, started stripping loose material off the rock cuts and getting what rock they could with the aid of a Southwest 25,000-pound ripper.

Drilling crews went right to work on the one big rock cut that accounted for 100,000 of the 398,000 cubic yards of excavation on the job and which supplied the material for the big fills on either side. Using a Gardner-Denver Air Trac and an Ingersoll-Rand Crawl-IR with 4½-inch hammers, the crews put down

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60-inch Belt Loader Handles Dike Job in Record Time

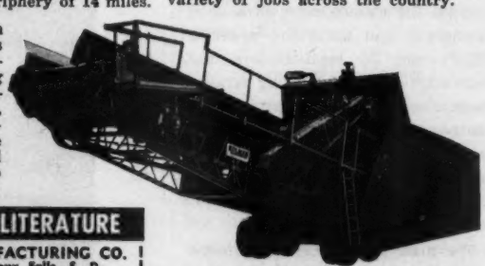
KOLMAN 303 LOADER

Kolman 303 Keeps 23 Trucks Operating at Capacity

Operating only at partial capacity due to lack of elbow room, a Kolman 303 Loader moved over 400,000 yards of fill to complete well ahead of schedule a Gibbons & Reed project near Magna, Utah, that called for elevating the 30-foot wide tailing dike of an open-pit copper mine from 2½ to 7 feet over a periphery of 14 miles.

Available either as a completely portable unit with dual tandem axles and air brakes, or as a skid-mounted unit, the Kolman 303 combines the economy of conveyor belt loading with the speed of dozer charging. It has demonstrated its versatility in a variety of jobs across the country.

The big 60-inch belt kept 23 trucks operating at capacity. Four big Cats, pushing 5-yards per trip, were busy charging the huge surge pile that covered the 303 feeder-trap and tunnel.



The portable unit can be towed on the highway at normal speeds. It is equipped with a fifth wheel pin and air brakes and is easily handled by an ordinary semi-tractor. Once on location, it can be set up and operating in 30 minutes.

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Material hauled out of the cut by a Euclid end-dump is dumped on the fill to be spread by a Cat D6 tractor-dozer and compacted by the McCoy sheepsfoot roller pulled by the D8.

(Continued from preceding page)

3½-inch blast holes to an average depth of 30 feet. Air for the drilling was supplied by a Gardner-Denver 900-cfm rotary and a Worthington 600-cfm rotary compressor. The engines of both compressors were equipped with turbochargers to build up their horsepower at this 8,700-foot elevation.

The blast holes were loaded with Du Pont Nialite explosive, and a 5-pound stick of dynamite was used in each hole for the detonator. This ready-mixed fertilizer-type explosive proved easy and economical to use and provided excellent fragmentation of the rock.

Two Euclid end-dumps and a Northwest 80-D shovel built the approach fill as they dug into the east side of the cut. Here, the haul road was not as steep as it was on the west side.

Scrapers handle rock

The scraper spread took over the job of moving the rock down the steep westerly slope and building the fills on that side. At the start, when the scrapers got their loads near the top of the cut and had to deliver them to the bottom of the fill, the haul road was extremely steep. Dragging their scraper bowls for braking, these rigs had little or no trouble getting down the steep grades with their loads. Getting back up was another matter. For a long time, while the haul road grade was steeper than 20 per cent, one of the tractors was kept busy pushing the empty scrapers back up to the cut.

This rock, even after it was shot and sometimes ripped, was a very difficult material to load. However, by keeping the loading zone on a good downgrade and using the powerful HD-21 and D9 push-tractors, the contractor obtained heaping scraper loads in a remarkably short time. The average haul was around 1,200 feet, and one push-tractor could not quite keep up with the three scrapers.

Compaction

The material was carefully spread and shaped on the fills by a tractor-dozer, then walked down by a heavy McCoy sheepsfoot roller pulled by a D8 tractor. Two 4,000-gallon water tankers kept the fills and haul roads wet to hold dust down and aid compaction. In finishing off the grading section, the contractor placed a 6-inch lift of select subbase material over the complete 54-foot width of the roadway. Base and paving, covered by a separate contract, will be done when the second section of the Crow Hill road has been graded.

Personnel

Supervising the job for Z. H. Lowdermilk were superintendent Don McGuire, general foreman Tom Dean, powder foreman Tony Jensen, timekeeper Lloyd Smith, and labor foreman Dan Lopez. For the Colorado Department of Highways, Robert W. Patton was resident engineer, reporting to district construction engineer Fred Stearns of the Denver District. The district engineer is George N. Miles and the construction engineer for the department is W. J. Walsh. Mark U. Watrous is chief engineer.

THE END

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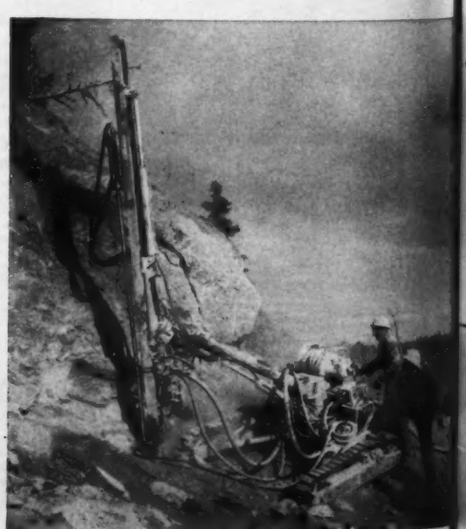

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Purchasing:

Buying for a job

by GEORGE E. DEATHERAGE, P. E.
construction consultant

When it comes to buying equipment and materials for a job, the buyer will have to take into consideration a number of factors aside from price, such as quantity, suitability to the job, distribution, policies, and guarantees.

Before a requisition is written, the buyer should check to find out if any available salvaged materials from other jobs might suit the purpose. If so, this must be indicated on the Bill of Material in the remarks column and be called to the attention of a higher authority.

Buyers should always question whether an item to be purchased is in a quantity to fit usual production or distribution practices. Often it is possible to buy a larger quantity at cheaper prices than split packages. A carload lot is not, as far as weight is concerned, the same for all commodities. Tariffs should be consulted in order to determine the minimum carload requirements.

The possibility of substituting a standard item for a specialty item should be considered by the designer, material biller, and the requisitioner before the request reaches the buyer. But, regardless of this, the buyer will have occasion to consider a substitution.

Reciprocity agreements

An important phase in purchasing relations between the contractor, owner, and vendor is reciprocity of business. Decisions on this usually come from a high authority, and construction management must be aware of these possibilities when setting up purchasing schedules. Buying a higher-priced material is justified if there is a potential contract in the offing.

Not less than three prices or bids should be solicited on any purchase in order to assure a decent market coverage and avoid the possibility of the vendors getting together on a price. In many cases, more than three are justified to assure clean competition and broad market coverage.

On private work, management is free to limit the number of bidders. On a great deal of work financed with public money, an opportunity must be given to any citizen who wishes to put in a price.

Quotations should be solicited from concerns that have satisfied all prequalification tests and are good potential suppliers. There is no point in going through the motions to secure prices just to satisfy record requirements.

The greatest consideration in limiting the number of accounts is that of benefits to be derived from reciprocity. Next is the requirement to build up a rating with the supplier which, in times of shortages, will give the contractor preference on deliveries. Coupled with this is the requirement to make bulk purchases from one or more suppliers in order to build up volume and secure a special preferential discount.

Sources of information

The purchasing office should have on hand all current information on possible vendors.

"Sweet's Catalogs"—available free from the F. W. Dodge Corp., 119 W. 40th St., New York City—is mainly concerned with the building trades. It carries the names and addresses of suppliers; and its advertisements include complete descriptions of the products, the manner in which they are used, details of construction, usual specifications of the product, and the requirements to obtain the best results.

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(Continued from preceding page)

dustry, together with trade names, are compiled in "Materials Handbook," by George S. Brady. This reference book is priced at $13.50 and is available from McGraw-Hill Book Co., 330 W. 42nd St., New York 36, N. Y. From the data in this handbook, a buyer can prepare clear and definite specifications to meet the job requirements.

"Thomas Register" names, indexes, and classifies nearly all manufacturers in the United States, and indexes and cross-indexes products. This 5-volume work, which is revised annually, may be purchased for $15, plus shipping charges, from Thomas Publishing Co., 461 Eighth Ave., New York 1, N. Y.

Wholesale, retail purchasing

The buyer should make every attempt to purchase direct from the manufacturer, in order to procure the best possible price and delivery. Many firms sell direct from the mill, or through agents or brokers. Such purchases are rarely less than carload or full truckload.

The retailer, on the other hand, stocks items for immediate delivery, securing stocks from the wholesaler, who in turn is a warehouseman and distributor for the manufacturer or producer. The amount saved in buying from a producer may be negligible when compared to the convenience and time saved in retail buying.

If the quantity exceeds the amount usually considered for over-the-counter sales, the retailer may be in a position, through arrangement with the wholesaler, to offer a preferential discount. The shipments are then made direct from the wholesaler's warehouse.

In many cases, the wholesaler will protect the retailer by not dealing directly with a contractor. However, the wholesaler will allow a contractor's discount for quantity.

In general, retail purchases should not be made unless the quantity is very small and purchasing from the wholesaler or manufacturer cannot be advantageously arranged.

A blanket order is credited to a bulk-purchase arrangement usually made direct with the manufacturer or producer. This may be for a specific job of long duration, and the contractor may cover all his requirements for partial deliveries during the length of the job. Or the arrangement may cover specific requirements for several jobs, and the total purchase may result in securing a lower price.

In many cases, the buyer may calculate his probable requirements over the current year and make an arrangement with the mill or producer for a sliding discount, depending on the maximum quantity actually ordered or the dollar volume. In such cases, all materials under contract are bought from this specific supplier in order to build up the volume and secure the lower discount.

The buyer then will have to decide whether or not there is time to secure the material from the mill. If not, he will have to pay a higher price to a wholesaler or retailer. Close and accurate scheduling of work is a vital factor in the cost of materials for any specific project. If it becomes necessary to revise or extend schedules, the purchasing agent should be notified immediately.

Clauses in the order

Clauses for workmen's compensation, public liability, etc., are ordinarily demanded on the order, when the supplier must, as part of his service, have his men perform labor on the site. A purchase order that contains clauses for general conditions usually includes only part of the requirements and is a poor substitute for a subcontract, which covers every possible contingency in connection with the work.

To be safe, the contractor always uses a subcontract form and general conditions for any transaction in which labor is to be performed on the job. This subcontract then is to be covered with a confirming purchase order, which serves to enter the transaction on the purchasing-order register and on the books. Where general conditions are written in or

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printed on the back of the purchase order, they are used mainly on small work of a simple nature, where the buyer does not wish to go through the formality of making out a subcontract.

Many times the vendor or supplier will have special terms and requirements printed on the back of an acknowledgment of order. The buyer must avoid committing himself to terms and conditions at variance with the purchase order itself. He should be wary of signing the supplier's form or order or subcontract; these often contain hidden clauses which favor the supplier.

Specifications

At times, a requisition may not spell out the material specifications, and the architect or engineer may not realize how this omission affects prices or quality. Quite often the buyer may be able to define his own specification. If recurrent purchases are being made, much inconvenience and trouble can be avoided by having standard specifications prepared as part of the purchase data file.

However, specifications may go to the opposite extreme and be too rigid. Proper evaluation of them may often make it possible to gain economy on purchases. High-tensile-strength bolts may be specified, for instance, when their use is not warranted. Lower grades of lumber may often be used for forms below ground, when the surface of the concrete is to be covered with backfill. A material may be too good for the work it has to do, as well as not good enough.

Buying on drawings

When buying is done on an architect's or engineer's drawings on contract work, the requirements for samples will be covered in the job specifications and the buyer should be familiar with them. If the contract is on an AIA form, the manner of handling samples will be found under general conditions. In these cases, written approval should be secured before the actual purchase is made. Blueprints should be supplied when there is the slightest evidence that their use will assist in clarifying exactly what is needed or how the material or item is expected to connect with or anchor to adjacent work. A request for quotation should always identify the drawings being forwarded by title, number, and data of the latest revision. If one source may not be able to make delivery at the required time, it may be necessary to split the order, bringing in other suppliers who can meet the dates.

Verbal orders should be issued only in an emergency and should be limited to small unimportant items. Omission of a written requisition can be confusing and the cause of frequent misunderstandings.

It is well within the bounds of good purchasing practice for the job foreman and other authorized persons to make emergency local purchases on small items, but in each case a requisition should be made on the spot, and a duplicate sent to the purchasing agent. The best results are obtained when the requisitioner on the job is supplied with a pocket-size book of forms that are numbered consecutively. The original is given to the supplier, the duplicate goes to the purchasing agent or main office, and the triplicate remains in the book as a job record. The form should also include the job number, the charge account to the cost code, the name and address of the supplier, together with a warning in fine print to write down the information correctly and specifying that the supplier is not to furnish any material without such requisition.

The user or requisitioner should be notified if a required delivery date cannot be met, even though the purchasing agent or buyer has a schedule which shows a date a little later than that on the requisition. These notifications should be confirmed by a memorandum, a copy of which goes to the scheduling clerk.

Many times, on fast-moving jobs, the engineers are not always familiar with what has been standard practice and specify a certain type of material. In other cases, changes in materials made purely through a preference make it necessary to look up new

This is the forty-second of a series of articles on Construction Management by George E. Deatherage, P. E., consultant to National Schools of Construction Management and Heavy Equipment Operation, P. O. Box 527, Weiser, Idaho, and P. O. Box 8243, Charlotte, N. C. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by the National Schools. The manual is used in a training course for superintendents and project managers, and is directed primarily at those contractor employees at the foreman level or its equivalent, who need practical help in order to take complete charge of construction projects themselves.

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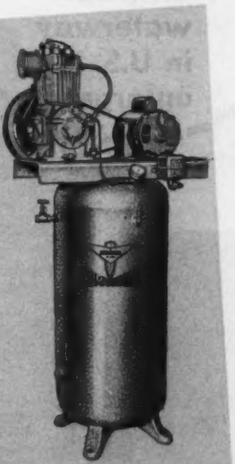

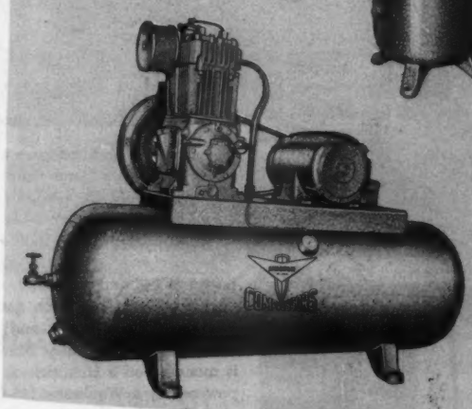

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(Continued from preceding page)

sources of supply or even disregard stocks that may be on hand. The buyer can act as a brake on such practices.

Any change of this sort should be questioned. If a change is necessary, the information should be carried through on the purchasing data sheets.

Requisitions often flow in to the purchasing agent from all directions. He is in a good position to question why items to be used for the same purpose should not be standardized and the purchases bulked. One job may specify one type of material, and another job may call for a second type. When possible, one make should be selected and a standard set up. This will cut down purchasing expense and reduce inventory.

Inspecting requirements

Inspection requirements are to be set down in the purchasing order or subcontract. The buyer must know the nature and extent of the inspection—whether it is during manufacture, before shipment, after receipt, or after installation—and must also know the necessity for and cost of inspection, which varies with the different vendors.

The requirements are usually carried in the specifications that accompany the requisition, but if this is not the case, and inspection is necessary, the details will have to be determined and arrangements made as to extent, cost, etc.

In many cases inspection can be eliminated by having the supplier furnished with mill certificates, which are detailed sworn affidavits that the materials meet the requirements in all respects. This is quite common in purchasing such items as structural steel and cement.

Guarantees

Guarantees refer to some predetermined specification or performance requirement. If there are specifications, these will usually state requirements for such guarantees.

On items of minor importance, the purchaser may be satisfied with written guarantees on delivery in letter form and without penalty in case of failure to meet dates. Where the matter is important enough to introduce a penalty for nonperformance on deliveries, a supply bond may be demanded.

Requests for guarantees will take into consideration the standing and past record of any contemplated supplier; it may be an old and reliable firm, or it may be one with little experience and against which some protection seems desirable. The purchasing department is in the best position to gage this in its work of prequalification of vendors or bidders.

Performance bonds have to do with work requiring special labor on the site and, as such, are covered by a subcontract. Firms qualifying for subcontract work should be required to submit a financial statement in order to consider them for the bid or work. Standard forms are available for this purpose from the Joint Conference on Construction Practices, Munsey Bldg., Washington, D. C.

Securing materials

The length of time ordinarily taken to secure material divides itself into two specific phases: the time between date of requisition and date of the purchase order, and delivery time dating form the issuance of the order.

The time lag between the date of the requisition and the issuance of the order itself includes time required to secure quotations, compile and analyze them, and make a decision. This can be standardized for most items, and allowances in scheduling can be made accordingly. If the purchase cannot be made directly but is routed through a central office, the time will be extended.

Time required for vendor's delivery varies, depending on whether or not the item is a stock material or has to be manufactured or fabricated in the vendor's shops.

A predetermined time for delivery from the date of the requisition and the receipt of the material can be established and agreed upon with the scheduling clerk, permitting him to rough out schedules without checking each specific item. When definite dates are secured, the schedule may have to be revised in accordance with the latest information.

The delivery promises made and maintained by vendors should be recorded on the purchase data sheets. Then, when material is required in a hurry, the vendor who has given the best past service can be selected.

It is quite possible that a requisitioner may ask for fast delivery when it is unnecessary. Then the question arises as to whether the time differential overbalances the price differentials. Certainly every delivery date which results in increased unit costs should be questioned.

Shipments

A shipper will make shipment in the cheapest manner and over the cheapest route. Usually less carload freight is the slowest medium to use, as material may be held for pooling rather than transferred to connecting lines. Interstate truck shipments, express, air express, etc., should all be considered, even though these add to the expense.

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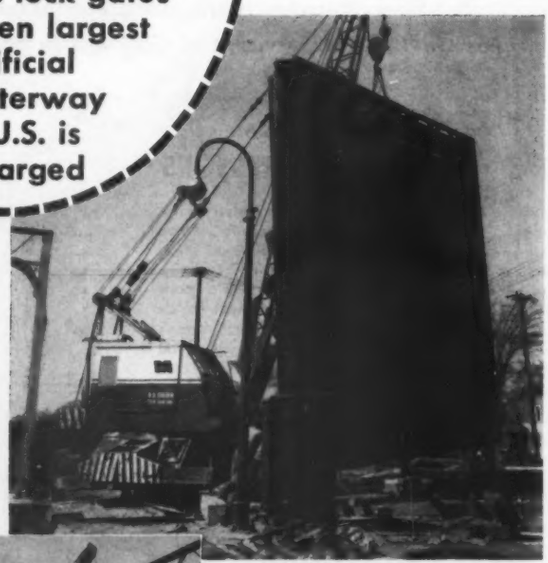
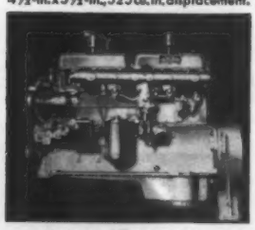
lifts lock gates when largest artificial waterway in U.S. is enlarged



● To handle the huge gates for locks in the New York Barge Canal expansion project—R. D. Golden Co. used this Waukesha-powered 40-ton Marion type 43-M mobile truck crane. With its Waukesha engine powering the 40-ft. boom, at 64° and at a 22-ft. radius—the 30 x 45 x 2 ft., 32-ton gates were lifted with ease, swung and lowered into position. This mobile Marion unit is mounted on a Hendrickson Carrier powered by a Waukesha 145-GK Engine. The upper frame has a Waukesha 140-GK Engine and Twin Disc torque converter.

Powering Crane (boom)—140-GK Waukesha Gasoline, six cylinders, 4½-in. x 5½-in., 525 cu. in. displacement.



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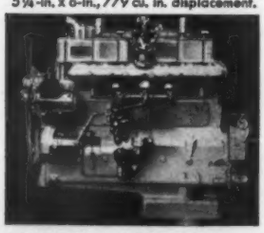
Powering the Carrier—145-GK Waukesha Gasoline, six cylinders, 5¼-in. x 6-in., 779 cu. in. displacement.



412

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

NEW YORK TULSA LOS ANGELES

Factories—Waukesha, Wisconsin, and Clinton, Iowa

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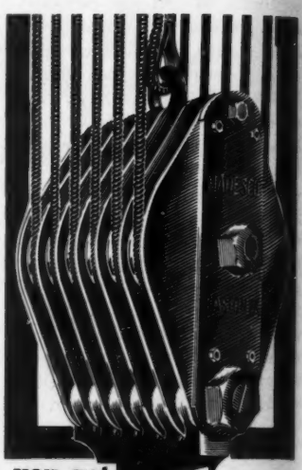

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You're hours and dollars ahead with MADESCO blocks on the job—they're *engineered* to shrug off the relentless beating that gruelling construction work involves. Around the clock and around the calendar you can be sure that MADESCO blocks have the ruggedness to serve you well . . . reflecting 30 years of specialized engineering in hoisting. Extra heavy space-saver crane hook blocks, extra heavy weighted blocks are among a *complete* line to exactly meet your needs. Consult your supplier or write our engineering department.

MADESCO TACKLE BLOCK CO.
Main Office, Easton, Pa.

MADESCO BLOCKS

MAE—MAD 820/280

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A checking of scheduled dates for delivery may be warranted in face of the additional costs. Time may be saved by wiring or phoning an order and confirming it later with a purchase order or contract. If a traffic department is maintained, as happens on the larger work, it may handle all details, including expediting. Or, Planning and Production may do this job.

Some vendors are habitual overshippers, shipping more than what is called for in the order in the hope that the overshipment will be overlooked or accepted. Purchasing records will quickly show this, and the contractor should stop dealing with such vendors. If the price is such that it is not good business to count them out, an overshipment warning should be included in the purchase order, stating that overshipments will be returned to vendors at their expense.

A cancellation clause should always be inserted in an order or subcontract whenever there is a tight schedule and delay in delivering the materials is liable to delay or extend the work. Such clauses should also cover failure to ship required predetermined quantities, preventing "token" shipments made to validate contracts.

On stock materials, this situation can be covered in a sentence or two. On special fabricated materials, which the supplier or fabricator cannot easily dispose of in the open market, a more extensive coverage will have to be made.

Securing and checking of field measurements usually implies labor to be done by the vendor on the site. It should be specifically understood in writing that the purchaser takes no responsibility for error. Check approval prints carefully before signing them.

It is not usual to provide special insurance on shipments of construction materials carried by railroads, but it is often necessary on truck shipments, for the carrier insures only to a fractional part of values. The shipper usually provides the insurance, since the purchaser does not come into title until the materials have been received.

(Next month's article will deal with "Purchasing: Preparing Subcontracts.")

Revised book on dynamics

The second edition of "Mechanics Part II: Dynamics," by J. L. Meriam, provides a more logical arrangement of topics and a more direct approach to the subject. Included in the book are chapters on the principles of dynamics; kinematics—absolute and relative motion; force, mass, and acceleration; work and energy; impulse and momentum; and periodic motion.

Four appendixes contain review problems; vector methods; moments of inertia of areas and mass; and useful tables. A list of problems concludes each chapter. Formulas and diagrams illustrate each topic.

The $5 book may be purchased direct from John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.

WORKING IN SOFT UNSTABLE SUBSOIL, an International TD-24, with cable and winch, helps a Euclid S-18 push-loaded by a Cat D9 to pick up a full load during grading of the R. H. Baldock Freeway south of Portland, Ore. Crews worked two 8-hour shifts, six days a week, to shape up this 4-mile section.

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- **LIGHTWEIGHT:** 2-cycle simplicity and judicious use of aluminum in construction reduce the weight of Jlo Series diesel engines to less than 15 pounds per horsepower!
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- **PERFORMANCE-PROVED:** Jlo Series air-cooled diesel engines have been used in every climate for every service in their power range. Fast-starting and rugged, they are ideal for both "stand-by" and continuous-duty operation.

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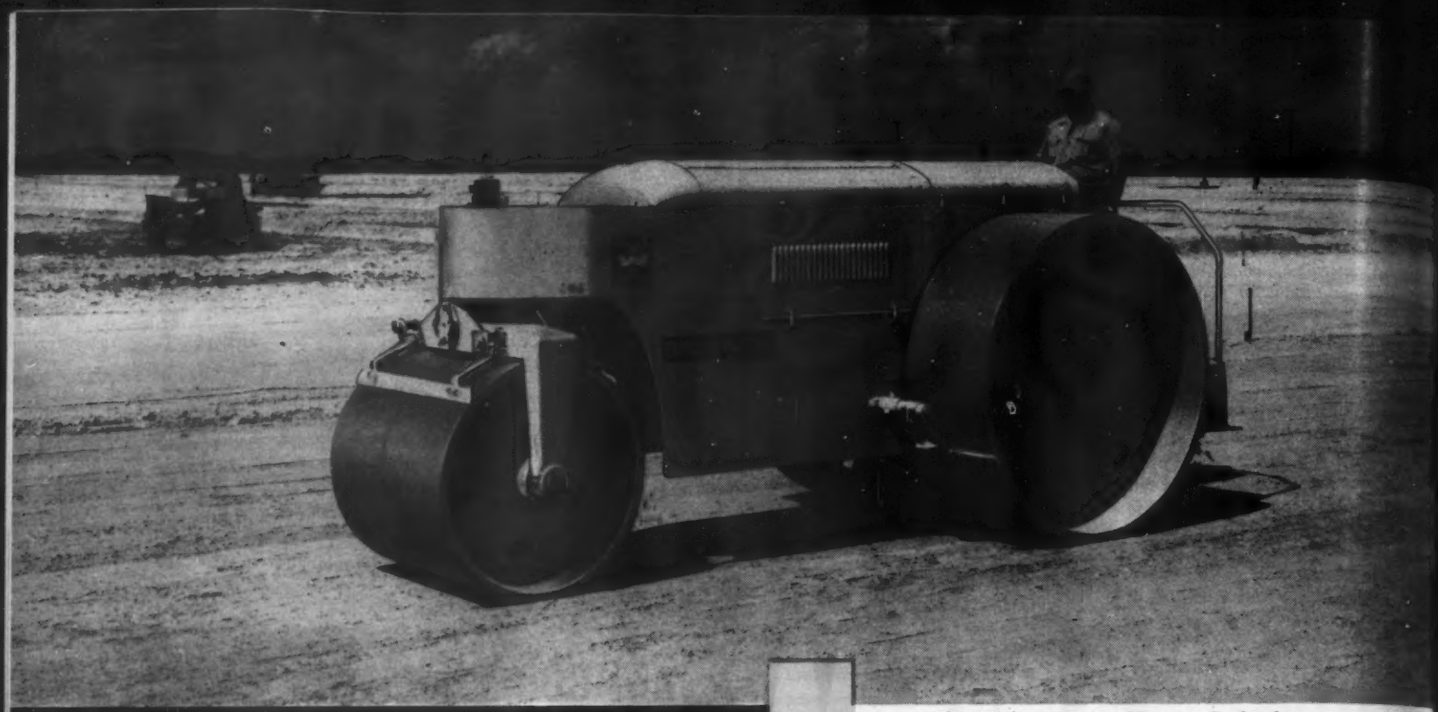


This Huber-Warco 10 ton 3-wheel is compacting a lime rock base for Capeletti Brothers of Miami.

H-W 3-wheel at work for Florida contractor

When called on to handle the rolling operations in a Hialeah, Florida, subdivision, Capeletti Brothers Inc., a Miami paving contractor, put their three Huber-Warco 3-wheel rollers on the job.

This subdivision, developed by the Palm Springs Development Corporation, included approximately 2000 homes and a new school. Capeletti handled the contract for the streets and roads in the project, as well as the construction of a 100′ x 200′ parking lot at the new school.

A typical comment about the performance of the Huber-Warco 3-wheel was voiced by Frank Worrall, the supervisor for Capeletti on this project. He stated, "The torque converter in this machine permits us to do better work with less effort." Mr. Worrall continued, "Efficiency is increased even at slow rolling speeds."

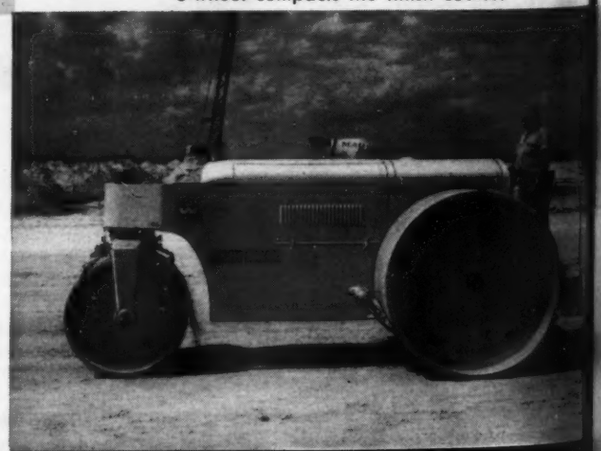
The combination of a torque converter and 2-speed transmission in the Huber-Warco 3-wheel means more economical operation, longer parts life and fast steering at all speeds.

Your Huber-Warco distributor will be glad to give you complete specifications for the standard and variable weight models in the 3-wheel roller line. He can arrange terms up to 36 months for you on the purchase of a new machine, and can provide you with a rental unit.

Huber-Warco on the job

Better work with less effort.
Increased efficiency even at slow rolling speeds.

On the new school parking lot, this Huber-Warco 3-wheel compacts the finish course.



Huber-Warco Company

MARION, OHIO

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HUBER W WARCO

Convention calendar

May 13-15 National Rivers and Harbors Congress
Meeting, Mayflower Hotel, Washington, D. C. William H. Webb, executive vice president, NRHC, 1028 Connecticut Ave. N. W., Washington 6, D. C.

May 18-19 Society of American Military Engineers
Thirty-ninth Annual Meeting, Mayflower Hotel and Naval Ordnance Laboratory, Washington, D. C. Col. F. H. Kahloss, executive secretary, SAME, 808 Mills Bldg., Washington 6, D. C.

May 25-26 Wire Reinforcement Institute
Meeting, The Greenbrier, White Sulphur Springs, W. Va. Frank B. Brown, managing director, WRI, 1049 National Press Bldg., Washington 4, D. C.

May 25-28 Design Engineering Show and Conference
Show and Conference, Convention Hall, Philadelphia, Pa. Banner & Greif, 369 Lexington Ave., New York 17, N. Y.

May 25-30 Concrete Reinforcing Steel Institute
Meeting, The Greenbrier, White Sulphur Springs, W. Va. H. C. Delzell, managing director, CRSI, 38 S. Dearborn St., Room 1625, Chicago 3, Ill.

June 17-20 National Society of Professional Engineers
Annual Meeting, Commodore Hotel, New York, N. Y. C. L. Ritchie, NSPE, 2029 K St. N. W., Washington, D. C.

June 21-26 American Society for Testing Materials
Annual Meeting and Exhibit, Chalfonte-Haddon Hall, Atlantic City, N. J. ASTM, 1916 Race St., Philadelphia 3, Pa.

June 24-25 The Asphalt Institute
Mid-year Meeting, Hotel del Coronado, San Diego, Calif. The Asphalt Institute, Asphalt Institute Bldg., University of Maryland, College Park, Md.

June 29-July 1 American Society of Landscape Architects
Sixtieth Annual Meeting, Palmer House, Chicago, Ill. Arthur Fitzgerald, general chairman, ASLA, 1119 Pine St., Glenview, Ill.

June 29-July 1 School for Highway Superintendents
School, Riley-Robb Hall, Cornell University, Ithaca, N. Y. James W. Spencer, highway research and extension engineer, SHS, Department of Agricultural Engineering, Riley-Robb Hall, Cornell University, Ithaca, N. Y.

July 25-29 National Association of County Officials
Tweny-third Annual Conference and Products Exhibit, Sheraton-Cadillac and Statler-Hilton Hotels, Detroit, Mich. Bernard F. Hillenbrand, executive director, NACO, 1001 Connecticut Ave. N. W., Washington 6, D. C.

Spring maintenance, calcium-chloride data

The Calcium Chloride Institute has issued two bulletins. Manual HM-1, "Calcium Chloride—Handling, Storing, and Applying," provides data on approved methods and includes a special section on winter maintenance. This manual has been written especially for highway engineers, contractors, and material suppliers.

"The Importance of Timely Spring Maintenance," the second bulletin, describes effective procedures for spring conditioning of unpaved roads. It tells what to do with roads that have had calcium chloride in the past, and with roads that have not. The bulletin also contains two application charts.

Copies of both bulletins are available free of charge from the institute, 909 Ring Bldg., Washington 6, D. C.

LOADING BORROW MATERIAL are two Caterpillar DW21 scrapers on a grading project near Lowell, Mass. A Cat D9 tractor-dozer pushloads the scraper at right. An average 3,500 yards of borrow, moved every 8½-hour day, enabled Bayer & Mingolla Construction Co., Inc., Worcester, to complete the 2.6-mile relocation project a year ahead of time.

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J·RAIL

a rugged new Trailmobile flat designed around super-strong T-1 steel

Husky "I" shaped main rails are feature of new design that offers exceptional strength while eliminating unnecessary weight.

Underside view shows how I-beam cross members go through husky "I" shaped main rails. Note that cross members are welded in place at intersection points.

Stake pockets accommodate lightweight aluminum racks for easy conversion to open top. Inset sketch shows unique one piece design of rub rail that adds extra strength.

lighter! stronger! lower in price!

The use of brawny T-1 steel (105,000 lbs. tensile strength) in the main rails of this new Trailmobile achieves a new standard of performance for flat trailers. Weight has been cut by literally hundreds of pounds! In fact, this powerful all steel design all but matches the lightness of aluminum units.

Approximate weight is only 8500 pounds—so with a 72,000 pound gross vehicle weight the J-RAIL gives you up to 50,000 pounds of payload capacity! And you get all this profit capacity in a trailer that costs less than any comparable steel or aluminum flat available today.

Further, the J-RAIL, available in lengths up to 40 feet, will take tandem-tandem operation . . . can be equipped with any kind of suspension (including a standard tandem, 9 foot spread, Trail-Level air-tandem or sliding tandem) . . . and it can be easily converted to an open top with the addition of light aluminum racks.

Before you buy any flat, look into the singular advantages offered by the new Trailmobile J-RAIL. You simply can't get better performance—at any price.

TR-782

TRAILMOBILE INC.

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Seven-stage work schedule for 22-track overpass keeps rail traffic moving

An overpass for 22 railroad tracks—one of the seven structures covered by a contract for a section of the Innerbelt Freeway in Cleveland—is being built in seven stages to keep rail traffic moving smoothly. Armco cylindrical piles are being driven here for the west abutment by a Vulcan hammer. Two steel H-beam rings support the Z-type interlocking sheet piles of the cofferdam.

Maintaining the railroad traffic flow on 22 main tracks of the Pennsylvania Railroad, while building a roadway underneath them, calls for some tight construction scheduling.

The bridge to support these tracks is just one of seven structures on a $7,805,000 contract, held by Bates & Rogers Construction Corp., Chicago, Ill., to construct a section of the Innerbelt Freeway between Superior Avenue and the Memorial Shoreway in Cleveland, Ohio.

Short but complex

This freeway section, consisting of two 52-foot roadways, includes many off and on ramps connecting with existing streets; a complex interchange with the shoreway; and bridge structures to carry Pennsylvania and New York Central tracks over the alignment. A temporary timber trestle was built, adjacent to the six New York Central tracks, to permit traffic to be rerouted during construction of the permanent overpass. Four temporary tracks on the trestle handle this traffic flow.

The complex part of this contract is the scheduling of rail traffic on 22 Pennsylvania Railroad tracks that have to be rerouted. To keep a maximum number of tracks in operation while the overpass is being built, Bates & Rogers set up a 7-stage schedule for constructing the bridge.

The bridge spanning the two 52-foot roadways will consist of two abutments and a center column pier. The abutments and pier will be about 300 feet wide to accommodate the 22 tracks.

Each of the stages is about 45 feet long and consists of either cofferdam construction or open cuts. For the first two stages, the contractor built three parallel cofferdams 90 feet long and 24 feet wide. This decommissioned six of the tracks and permitted Bates & Rogers to excavate the exist-

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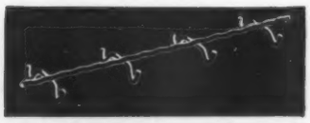

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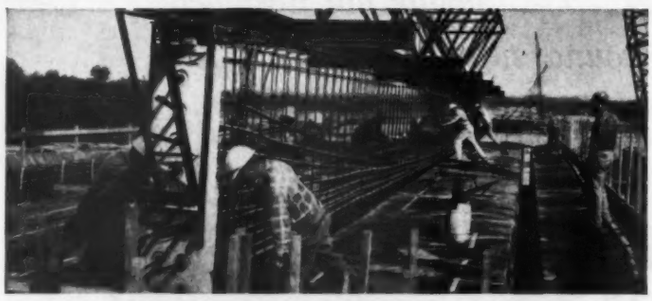
CUT PRODUCTION TIME AND COST ON POST-TENSIONED JOBS!

The Wolcott Avenue Bridge in Connecticut illustrates how a contractor's know-how, together with the use of Freyssinet post-tensioning methods, reduces production time and cost. Merritt-Chapman & Scott completed the 14 cast-in-place spans, each 120' long, months ahead of schedule. *Intercontinental Equipment Co. supplied the post-tensioning stressing components.* Full details on the Wolcott Avenue job and our prestressing materials and equipment are available now. Your inquiry is invited.



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Toss away those old fibre sweeping brooms and replace with a Danline wire brush — once — let your sweepers do a thorough job. You'll get up to 3000 sweeping miles from one Danline, and you'll get it at less than 10 cents per sweeping mile . . . Danline's engineered construction allows rapid assembly — uses special round brush wire — already proved on the toughest industrial jobs . . . Two men, in less than twenty minutes, can easily assemble a Danline . . . A Danline brush can remove 10" of sand in a single pass! . . . *For a really clean sweep,* test one on your own sweeper.

*U.S. Pat. 2864112

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59-2

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NEWARK

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ing track fill to a point very close to the operating tracks. Cofferdams were required to support the adjacent track fill during construction of Stage 1 and 2 abutments and pier. Smaller, but similar, cofferdams were built during this time to permit construction of the Stage 5 substructures.

Work schedule

After completing the abutments and pier of Stages 1 and 2, the contractor erected the steel superstructure and replaced the tracks. This activated the six decommissioned tracks and permitted the superstructure to be built for Stage 5. Five tracks were decommissioned during the Stage 5 construction of the pier and abutments.

After completing this stage and reactivating the five tracks, the area within Stages 6 and 7 will be excavated as an open cut. The decommissioning of the five tracks, which run through the area of Stages 6 and 7, will be possible by rerouting the flow over the completed bridge sections of Stages 1, 2, and 5.

Stages 3 and 4 will be handled as one operation and will probably be excavated as an open cut also. These stages will get under way after the five tracks crossing Stages 6 and 7 have been replaced and the traffic flow restored. Stages 3 and 4 will require the decommissioning of six tracks. The traffic of these six tracks will be rerouted over the completed bridge sections. If possible, excavation on Stages 3 and 4 will start before Stages 6 and 7 are completed. But this will be done only if the already completed bridge sections can absorb all the traffic flow.

Cofferdams driven

Bates & Rogers is using a McKiernan-Terry 9-B-3 steam-operated hammer to start driving the Z-type interlocking sheet piles for the cofferdams; driving is being completed with a Vulcan 50-C hammer. Sheet-piling lengths, averaging 42 feet, are braced by two steel H-beam rings. The lower ring, consisting of 14-inch H-beams, is positioned to clear the top of the footings, while the top 12-inch ring is positioned to clear the top of the abutment wall.

Two truck cranes, an American and a Lima, are being used by the contractor to excavate the cofferdams and to place concrete. The deepest excavation expected—about 30 feet—will be within the cofferdams before foundation pipe piles are driven.

The contractor expects to use about 50,000 linear feet of 12-inch-diameter and 158,000 linear feet of 14-inch-diameter Armco pipe piles to support the highway and railroad bridges,

Another overpass will carry the tracks of the New York Central over the freeway. The Marion with 90-foot boom uses a Vulcan 50-C hammer in 80-foot leads to drive Armco piles to 50-ton bearing for the bridge structure. The Cat 977 Traxcavator is excavating at the overpass site. A temporary trestle supports the New York Central tracks while the work is in progress.

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Blue Brute Air Tools give you a big money-saving feature—they resist rust and corrosion. The reason is an exclusive process: Blu-Coated Parts. With Blu-Coated Parts Worthington Air Tools operate better job after job and in damp atmosphere. They resist wear, seizing, galling. They hold oil better. Even after your toughest jobs you can store them for months without deterioration.

Blu-Coated and Worthington Distributor's Guaranteed Availability Plan keep your jobs going even if your tools are in for checkup or repair. GAP works this way: 1) bring in your Blue Brute tool for repair. While it's in distributor's hands he will, 2) lend you an air tool to keep your job going. See him for complete details, about Blu-Coated, GAP, and assured parts and replacements. 60-15

WORTHINGTON

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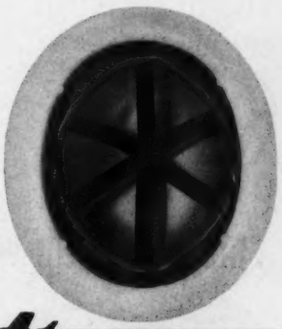

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Slings in Gentex Safety Hats use same design principle as slings in Gentex jet flight helmets. 6-pt. suspension, 3-layer crossover at crown. Rugged polyethylene shell exceeds all Federal Safety specifications, yet the Gentex weighs within ¾ ounce of any safety hat made. No metal parts — fully non-conductive.

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Instantly adjustable, snap-in suspension sling, well-ventilated construction insure comfort for every wearer. Good-looking, too — impregnated colors can't chip or flake. Available in green, gray, white, blue and yellow — in both hat and cap models. Examine the Gentex Safety Hat for yourself.

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IGLOO leads in water cooler sales because it's stronger, lasts longer. IGLOO will keep more men on the job more of the time. When you order water coolers, specify IGLOO. Available in 2, 3, 5, 10 and 15 gallon sizes.

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Some 630,000 cubic yards of excavation is required on the freeway project. This Bucyrus-Erie 38-B is using a 1¾-yard dragline bucket to excavate material from the new roadway alignment.

(Continued from preceding page)

respectively. The 14-inch piles, having ¼-inch thick walls, are shipped to the job in 60-foot lengths and have to be welded to reach the 120 and 130-foot penetration. Piles are driven to a 50-ton bearing by Vulcan 50-C steam-operated hammers handled in leads mounted on Marion 362 and 372 cranes. Piles are later filled with reinforced concrete. This type of pile was selected for the bridge foundation because of the greater skin friction developed. Bedrock, found at depths averaging 200 feet, made end-bearing piles impractical and too costly to use for this operation.

The Vulcan hammers driving the cofferdam piles are powered by two Vapor-Clarkson steam generators. These have oil-fired vertical boilers mounted on an International truck and on skids so that they can be readily moved around the project.

The abutment footings, 17 feet wide and 4 feet deep, are being constructed over the cylindrical piles that extend 12 inches into the footing. The two abutment walls will taper up 16 feet above the footing.

Reinforced-concrete columns, spaced on 12½-foot centers and supported on a concrete footing, will make up the center pier of the Pennsylvania Railroad bridge. The columns will be connected by a 4-foot 6-inch-wide × 5-foot-deep cap at each stage to permit the steel superstructure to be erected. Three-inch gaps will be formed in the long column cap to permit the construction of the pier in stages.

The general excavation and the paving of the two 52-foot roadways is being done under a subcontract by The American Construction Co., Cleveland, Ohio. Over 630,000 cubic yards of excavation will be required before the project is completed in December.

Personnel

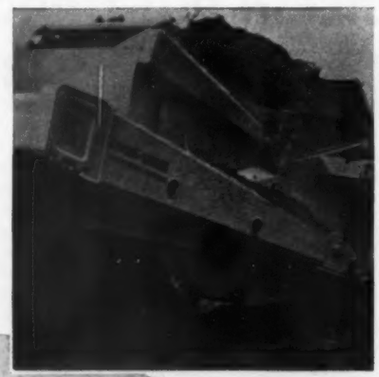
Frank Fogg is the superintendent and Richard Vogel, the project engineer for Bates & Rogers. Joseph R. Rogers is the resident engineer for the Ohio Department of Highways.

THE END

PCA opens Arizona office; names manager, consultant

A new district office at 213 N. First Ave., Phoenix, Ariz., has been opened by the Portland Cement Association. George M. Petzar, formerly of the Los Angeles office, is district engineer in the new office. Gene R. Morris continues as general field engineer in the Tucson area.

Thomas E. Long has been promoted to Eastern regional manager, supervising the association's field activities in 11 Eastern states. He will work out of the New York City office. Long succeeds Miley J. McMillan, who has been named senior consultant in the Promotion Division. McMillan, who remains in the New York City office for the initial phase of his new assignment, will serve as a consultant on matters of engineering and technical promotion.



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If it does, don't make a move till you've checked out the self-propelled CW-215 scraper. A 15 yd. struck, 21 yd. heaped unit . . . You can really accelerate the production of your equipment fleet with this "plus-yardage" medium capacity scraper — which will dovetail right into your present work cycle without upsetting schedules . . . Like all Curtiss-Wright scrapers, you also get a practical combination of unit construction, Roto-Gear steer, constant live winch and positive roll-out ejection. Ask your local Curtiss-Wright distributor to show you a CW scraper in action — he's the man to know if you want to move more dirt at a greater profit to you.

SOUTH BEND DIV. CURTISS-WRIGHT CORPORATION, SOUTH BEND, INDIANA

SOUTH BEND DIVISION
CURTISS-WRIGHT
CORPORATION
SOUTH BEND, INDIANA

For more facts, use Request Card at page 18 and circle No. 305

BPR progress report on highway program

"Progress Report on the Federal-Aid Highway Program," prepared by the Bureau of Public Roads, describes the progress of the program in the 2½ years since passage of the act. Information on the status of the National System of Interstate and Defense Highways is presented in tabular form and on two large maps printed in color. Data by states are included in an appendix.

Available at 70 cents per copy, the report may be purchased from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Dutch group submits plan for dam in Jersey meadows

A group of experts from Netherlands Engineering Consultants has presented a $15 million construction plan to the Meadowlands Regional Planning Board to put 15,000 acres of the Hackensack (N. J.) Meadows into condition for development. The key to the proposal is a dam near the mouth of the Hackensack River, from Kearny to Secaucus. The river would be kept open to navigation by a lock, and the level of the stream would be maintained by a sluice in the dam. A fresh-water lake would replace the present brackish tidal stream, which is a breeding place for the infamous Jersey mosquito.

The proposed dam would be 350 yards long and would be flanked by a short dike on the Kearny side and a long one on the Secaucus bank. It was also proposed to build earthen levees for 8½ miles along the bank of the river. Five pumping stations would be established to drain the protected lands, but the water table would not be much under the surface. The resulting land, which has a firm clay base, would be suitable for most uses.

Two proposals on the levees were presented. One suggests the levees be far enough apart to impound all drainage in the river; the other, which places the levees along the river bank, suggests setting aside 2,720 low-lying acres in Lyndhurst and North Arlington for development as a recreational area that would not be damaged in case of flood.

The Dutch plan considers only construction. It would take two years from the design stage to make the land usable.

The Meadowlands Regional Planning Board expects to present the plan to the state and federal bodies for consideration.

NICB re-elects two

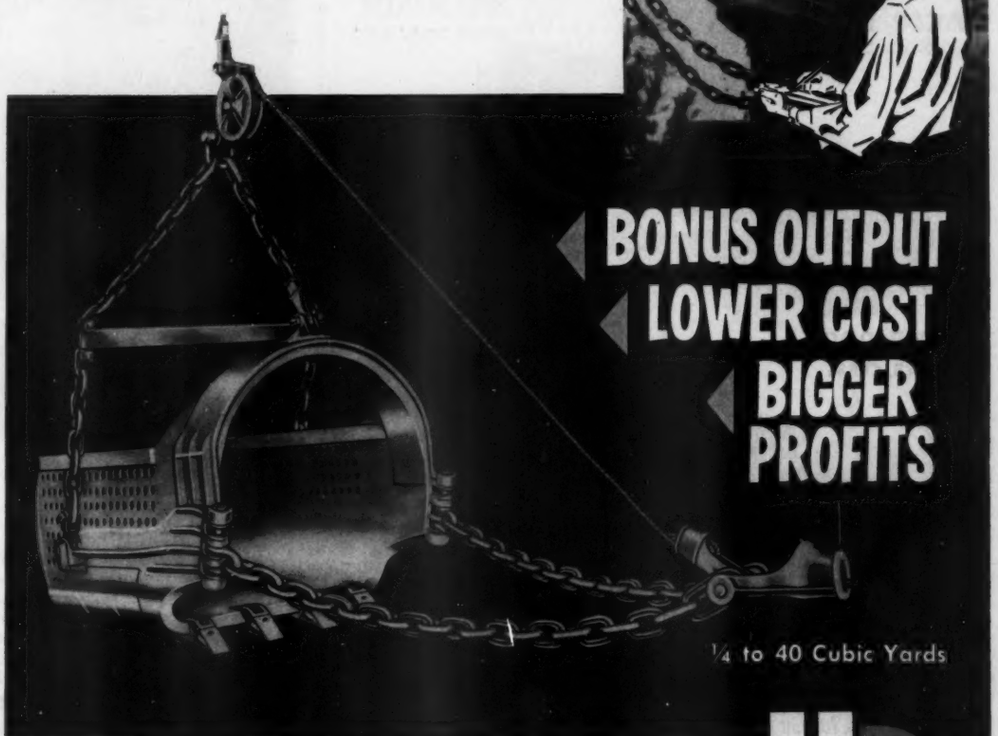
William E. Litle, chairman of the board of the Bucyrus-Erie Co., South Milwaukee, and Philip Ryan, president of Cutler-Hammer, Inc., Milwaukee, have been re-elected to a one-year term on the board of the National Industrial Conference Board.

The NICB is an independent and nonprofit institution for business and industrial fact finding through scientific research.

THIS BIG DRILL, an Ingersoll-Rand Crawl-IR, works on excavation for Consolidated Edison Co.'s nuclear-fueled electric generating station at Buchanan, N. Y. The completely mechanized unit tows its own air supply. Also helping out on the job, background, are two Ingersoll-Rand wagon drills. When completed, the $70 million installation will produce 275,000 kw of electricity with its nuclear reactor.

STAY AHEAD OF SCHEDULES WITH...

HENDRIX
DRAGLINE BUCKETS



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LOWER COST
BIGGER PROFITS

¼ to 40 Cubic Yards

"A Type for Every Digging Purpose" • • • Perforated or Solid

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

Hendrix Lightweight DB Dragline Buckets

For more facts, use Request Card at page 18 and circle No. 306

Two-mile pipeline job clears way for work on reservoir dam

Line bypasses dam construction area to assure city of continued water supply

Maintenance of the Newark, N. J., water supply during construction of a dam that will increase storage facilities for the city virtually entailed a separate construction job on a 10,700-foot-long pipeline.

The reservoir dam, Charlotteburg Dam, is being built across the Pequannock River near Newfoundland, N. J. The pipeline connects the existing reservoir above the site of the new dam with the aqueduct that brings water to Newark. This assures the city of an uncontaminated and uninterrupted flow of water while the dam is under constuction.

Sanitary Sewer Associates, Newark, the contractor on this $1,750,000 first phase, is a joint-venture combine consisting of LaFera Contracting Co., Newark; Joseph Miele Construction Co. Inc., Maplewood; C. Salvatore & Son, Orange; and George M. Brewster & Son, Inc., Bogota. LaFera is the sponsoring company on the job. Included in this contract was the construction of substructures for the screen chamber and aerator, chemical building channel, a supplementary pipeline to connect Echo Lake to the future reservoir, and a temporary steel pipeline to feed water into the permanent aqueduct extension.

This 2,500-foot-long temporary pipeline is made up of 48-inch-diameter 50-foot-long steel sections prefabricated and trucked to the job. The fabricator supplied the contractor with shop drawings that showed the location, bends, and pipe lengths to be installed. With this information, the contractor was able to dig the trench to proper depth and alignment to accommodate the sections to be delivered.

The pipe supports vary according to the grade and the type of terrain traversed. These supports include the conventional trench whenever the spring line is below existing ground elevation. Whenever the flow line requires the spring line to be above ground, the pipe supports consist of poured-in-place concrete piers on 16-foot centers. The piers are 3 feet thick and 6 feet wide. A ⅞-inch-diameter inverted-U steel bar holds down pipe at each pier location by hooking onto the eye of 1-inch anchor bolts. At each of these points the pipe was wrapped with two layers of 3-foot-wide tar paper to prevent any bond between the hold-downs and piers.

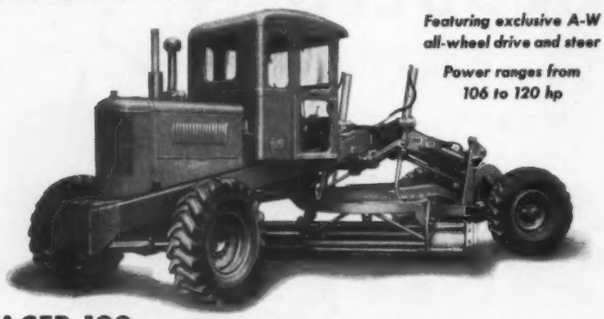
Anchorages in water

Whenever the alignment entered the river in water varying in depth from 2 to 4 feet, the contractor supported the line with concrete-filled burlap bags. Burlap bags were half filled with 1:2:4 dry-mix concrete, closed, and finally deposited in the water at an anchorage location. The

AUSTIN-WESTERN ANNOUNCES THE PACER!

A COMPLETELY NEW SERIES OF 4-WHEEL GRADERS

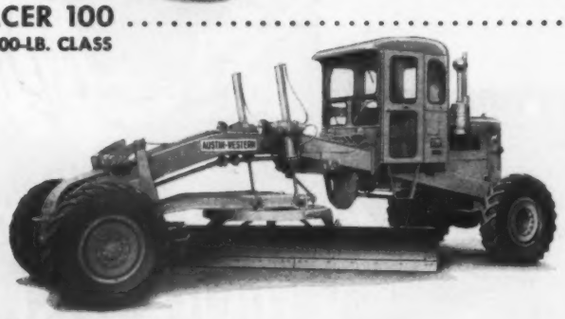
3 models offer added power, weight . . . new design, construction features; deliver superior speed, maneuverability.



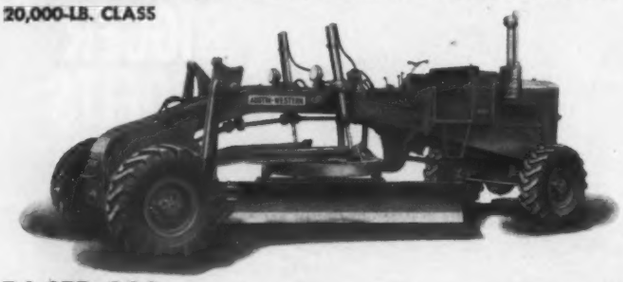
Featuring exclusive A-W all-wheel drive and steer

Power ranges from 106 to 120 hp

PACER 100 .....
16,000-LB. CLASS



PACER 200 .....
20,000-LB. CLASS



PACER 300 .....
21,000-LB. CLASS

See the all new Pacer models at your Austin-Western distributor's now. Ask for full information on the expanded line of advanced design 4 and 6-wheel graders!

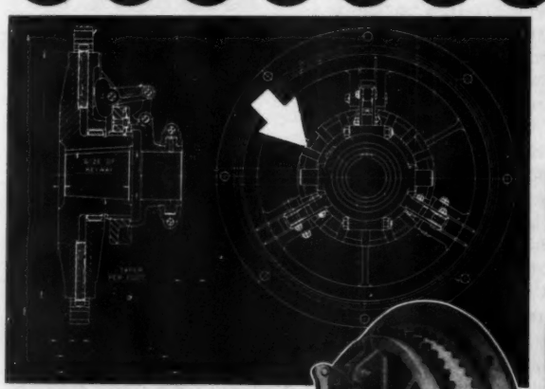
Austin 100th YEAR **Western**
CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

For more facts, use Request Card at page 18 and circle No. 307

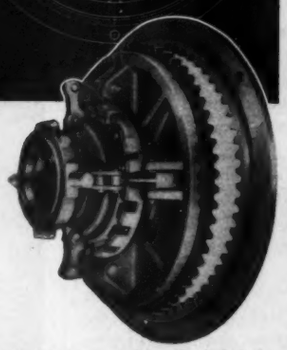
ROCKFORD



Small Spring Loaded

Heavy Duty Spring Loaded

Oil or Dry Multiple Disc



OVER-CENTER Gear Tooth Drive CLUTCHES Provide for CLOSE ADJUSTMENTS

Heavy Duty Over Center

Power Take-Offs

A conveniently accessible adjustment ring provides for infinitely close adjustment—in ROCKFORD Over-Center CLUTCHES—without special tools. Fine adjustments can be made, and automatically maintained, without releasing or engaging separate locking devices which formerly limited adjustments to the spacing of notches or holes. This is but one of several exclusive features of ROCKFORD Over-Center CLUTCHES.

Speed Reducers

SEND FOR THIS HANDY BULLETIN Gives dimensions, capacity tables and complete specifications. Suggests typical applications.

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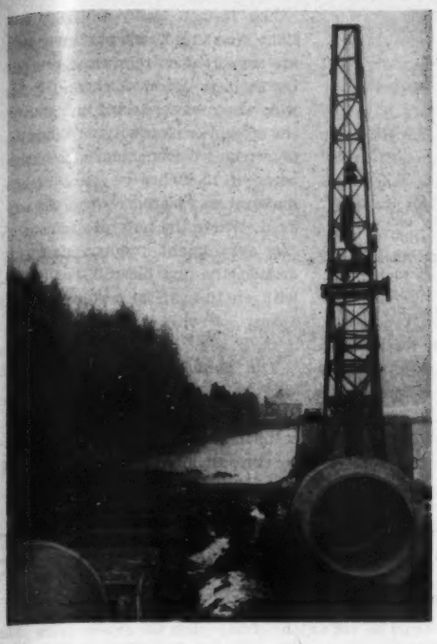
Export Sales Borg-Warner International — 36 So. Wabash, Chicago 3, Ill.

CLUTCHES

For more facts, use Request Card at page 18 and circle No. 308



◄ A P&H crane gets ready to lift a 72-inch-diameter pipe section onto the prepared base for the permanent aqueduct extension, which will tie into a temporary 48-inch-diameter section running to the existing reservoir, background. This will allow water to bypass the dam construction area.

The base for this stretch of 72-inch concrete pipe consists of a concrete footing on which the pipe cradles are founded. Amseal joints at the bell-and-spigot ends of the pipe sections provide a watertight connection.

bags were placed side by side, in courses with staggered joints. When water level was reached, the bags were tamped to form a flat surface. The bags provided supports 10 feet wide and 5 feet long on 16-foot centers along the pipe.

After the pipe sections were positioned on the dry-mix concrete bags, a concrete cradle was poured in place up to the spring line of the pipe. A precast reinforced-concrete collar, 8 feet wide, 3 feet thick, and 5 feet high, was then placed over the pipe to act as a hold-down. The area between the cutout of the 7½-ton collar and the pipe was grouted to

(*Continued on next page*)

The CF&I Image provides safety in action with **Cal-Tie Wire**

The safety-first contractor doesn't expose his workers to the hazards of working with cumbersome shoulder coils... he equips them with Cal-Tie Wire in a convenient belt-borne dispenser.

This method provides the safe, economical way to tie re-bars. It prevents eye and face injuries inflicted by the loose ends of shoulder coils, makes close quarter work easier, keeps workers' hands free. Waste from cut ends is reduced. The job is done quickly and efficiently.

Cal-Tie Wire—the quality-controlled wire—is available in gages 14 through 20. The light-weight coils fit any standard tie wire dispenser. Call the nearest CF&I sales office for complete information.

CAL-TIE® WIRE

THE COLORADO FUEL AND IRON CORPORATION

In the West: THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte Denver • El Paso • Farmington, (N. M.) • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Oklahoma City Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita
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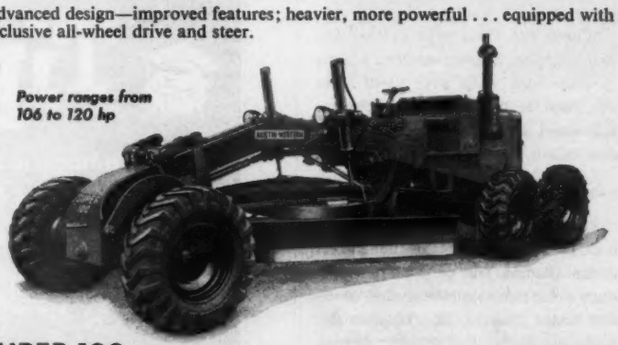
AUSTIN-WESTERN ANNOUNCES THE SUPER!

AN EXPANDED LINE OF 3 ALL-NEW 6-WHEEL GRADERS

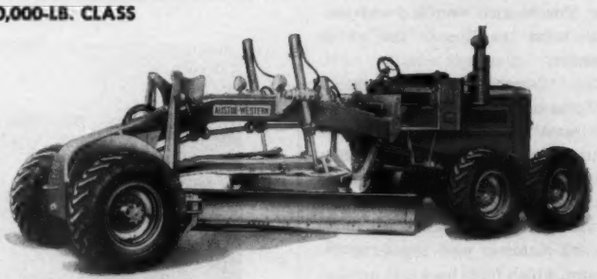
Advanced design—improved features; heavier, more powerful . . . equipped with exclusive all-wheel drive and steer.

Power ranges from 106 to 120 hp



SUPER 100
18,000-LB. CLASS

SUPER 200
20,000-LB. CLASS



SUPER 300
22,850-LB. CLASS

See the completely new Super models at your Austin-Western distributor's today. Ask for full information on the expanded line of 4 and 6-wheel A-W power graders!

Austin Western — 100th YEAR — CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

For more facts, use Request Card at page 18 and circle No. 310

(Continued from preceding page)

provide a uniform bearing on the ¼-inch-thick pipe wall. Field joints between the 50-foot-long pipe lengths were formed with watertight Dresser couplings.

The upstream end of the temporary steel pipeline was tied into the existing Charlotteburg Pond reservoir gatehouse, which controls the flow into the Pequannock River. The line carries this flow through the dam construction site and into the permanent concrete aqueduct extension 500 feet downstream from the new dam. Once the dam is completed, the concrete aqueduct will be extended back to the new intake structure in the dam, and the steel pipeline will be decommissioned. This temporary hook-up with the concrete aqueduct extension allows the Newark water supply to bypass the Pequannock River, which formerly carried the water from the Charlotteburg Pond reservoir to the existing Pequannock aqueduct. This bypass is required to maintain an uninterrupted flow during the construction of the dam across the Pequannock River.

Where the steel pipe crosses the dam location, heavier sections having ½-inch-thick walls were used. After the dam is completed, the decommissioned steel pipe will be grouted and left in place.

Aqueduct extension

About 500 feet downstream from the proposed dam, the contractor began placing the permanent aqueduct extension, which consists of 6,200 linear feet of 72-inch-diameter and 2,000 linear feet of 54-inch pipe.

The 54-inch-ID concrete pipe sections were placed at the starting point. These sections, delivered by truck from the Universal Concrete Pipe Co., a subsidiary of American-Marietta Co., are low-pressure sections having 5-inch-thick reinforced-concrete walls. All the concrete pipe sections for the project were delivered in 16-foot lengths.

The pipe is changed to 54-inch-diameter heavy-wall sections (9-inch-thick walls) when the line traverses a section of the river. This prevents any possible flotation of the empty pipe. The 54-inch standard-wall sections bring the line to the screen chamber.

The 72-inch-diameter standard-wall pipe sections were used where the line leaves the screen chamber. These sections have 7-inch-thick reinforced-concrete walls and weigh about 16 tons. This line then runs into the aerator, distribution chamber, and a 42-inch-diameter pipe bypassing the aerator, which feeds back into another 72-inch standard-wall pipe.

The line then runs to 72-inch heavy-wall sections (14-inch-thick walls) to cross a stream, then reverts to the 72-inch standard sections until it reaches the existing Macopin reservoir. Here, the line changes back to the heavy-wall pipe until it reaches the cone vault, where it ties into the existing two 4-foot-diameter aqueducts.

Pipe sections for the 48-inch temporary section of the line are ready to be installed once the Bay City crane finishes trench excavation. These pipe sections were prefabricated in 50-foot lengths and trucked to the job.

The 72-inch heavy-wall pipe sections, weighing 2 tons per linear foot, are supported on reinforced-concrete cradle piers 4 feet thick and 9 feet wide wherever the spring line is above the ground or river bottom. When the pipe required trenching, a minimum cover of 12 inches of select backfill material was placed around the sections. Where the natural drainage of the area might produce damaging erosion, the pipe backfill was topped with an 18-inch-thick stone slope.

Special pipe used

The permanent concrete conduit was built with American-Marietta concrete pipe equipped with Amseal watertight joints. This joint is formed by two specially shaped steel rings, in the bell-and-spigot ends of the pipe

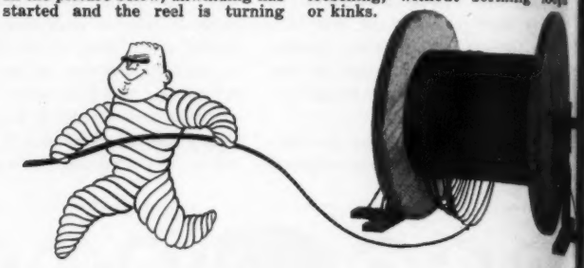
Tuffy® Wire Rope Tips

More Damage is Done by Broken Rules Than by Broken Strands—

***Rule 1:* RIGHT WAY to Set Up Reel for Unwinding**

The stock reel should be set up on jacks, so the rope will come from the under side of the reel.

In the picture below, unwinding has started and the reel is turning faster than the rope is being pulled off. But no damage is done. Why? Because in coming from the under side of the reel, the rope is simply loosening, without forming loops or kinks.



Tuffy Balanced Dozer Rope

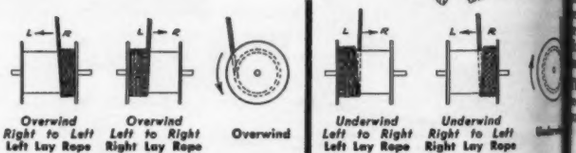
Built to give you longer service with less downtime. Mounted on your dozer, a 150' reel of ½" or 9/16" can give you a big bonus of extra service. Here's how: when rope shows drum wear or is crushed on the drum, you feed through just enough to replace the damaged part. You save the 40 to 50 feet ordinarily thrown away. Also available in 300' and 500' reels.

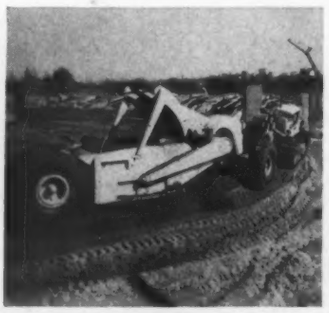
***Rule 4:* What's The Correct Lay for Each Type of Winding**

"Lay" refers to the direction of the strands in wire rope. It's a right lay rope when the strands pass from left to right across the rope. It's left lay when they pass from right to left.

The direction of winding on the drum is determined by standing behind it, looking toward the direction of rope travel.

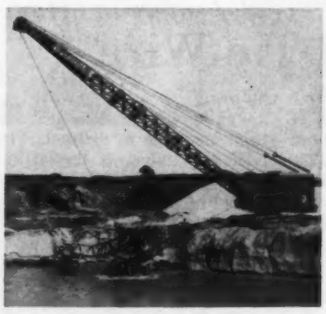
When winding one layer only on smooth drum, the right and left ropes indicated in the drawings below will give the best service.


L
R
Overwind Right to Left Left Lay Rope
Overwind Left to Right Right Lay Rope
Overwind
Underwind Left to Right Left Lay Rope
Underwind Right to Left Right Lay Rope



Tuffy Balanced Scraper Rope

"Balanced" construction makes it flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Also gives higher resistance to the shock of load impact on slack line. Moves more yardage per foot because it's specially built to take the beating of drum-crushing abuse.



Tuffy Balanced Dragline Rope

Here's highest abrasive resistance with super flexibility. Better spooling. Smoother riding on grooves. And Tuffy Dragline Rope hugs the drum when casting for full load. Gives you longer service life, consistent dependability, in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.

Tuffy Balanced Slings & Hoist Lines

"Balanced" because they combine strength, flexibility and toughness in the proper relationship to do a better job longer.

Tuffy Slings and Hoist Lines are a top-ing team in every type of materials h... The slings are made of a patented, ... braided fabric that's next to impossible ... or kink. The hoist lines are a special ... tion in which strength, flexibility and ... ness are balanced.

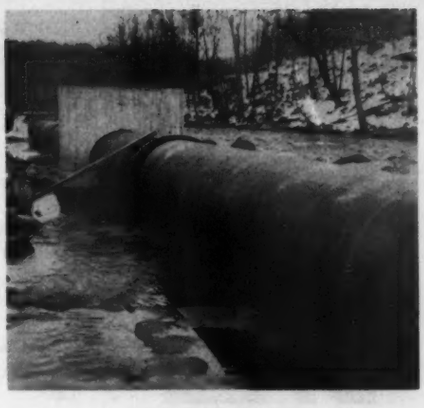
length, and a rubber gasket seated in a groove in the spigot ring. This continuous, round rubber gasket assures a watertight seal against infiltration or leakage, even under high pressures. When a joint is made, the round gasket is forced into a rectangular shape in the confining groove and is wedged in its place.

The volume of the gasket is such that it completely fills the space provided for it between the bell-and-spigot rings. Vegetable soap was generally used to lubricate the gasket thoroughly and ease the job of forming these joints.

Equipment at work

The contractor used a P&H 955 backhoe, equipped with a 2½-yard bucket, to handle the trench excavation on the project. Assisting was a Northwest 1½-yard backhoe. Other equipment on the job included a P&H 955 crawler crane, which handled most of the concrete-pipe placement; a P&H 255 truck crane with clamshell bucket, which was used to place the select backfill over the permanent conduit; and a P&H 555 truck crane, also equipped with a clamshell bucket, which excavated and formed the various structures on the job. The contractor placed the foundation slabs of these structures by having the ready-mix concrete trucks dump into a laydown bucket that handled concrete placement in the excavation. The contractor was not permitted to chute concrete into place.

The contractor also used a Bay City truck crane for such miscellaneous work as trench excavation, muck removal, and backfilling. A Michigan front-end loader was used to load the job's 7 Mack dump trucks with backfill material taken from a city-owned borrow pit. Three Ingersoll-Rand 600 air compressors supplied power to drills and pneumatic tampers during trench excavation and backfilling operations.



In places where the 48-inch temporary line crosses water, it is supported on stacked burlap bags half filled with dry-mix concrete. The pipe is tied down by precast reinforced-concrete collars that rest on blocks or poured-in-place concrete.

Dry-mix concrete is placed for the base of the feeder channel of the chemical building by a P&H 555 with a clamshell bucket. This work was included in the pipeline contract.

Personnel

George W. Andress is the director, Department of Public Works, and A. J. Simpson, the division engineer of the Division of Water Supply, for the city of Newark. Parsons, Brinckerhoff, Hall & Macdonald, New York City, is the consulting engineering firm on the project for the city of Newark. G. Gale Dixon, an associate, is in charge of the over-all project, while H. L. Kaufman, the project engineer, is in charge of the design work at the firm's home office. Joseph Goldbloom is the resident engineer, and T. W. Muzzy, the assistant resident engineer on the job for Parsons.

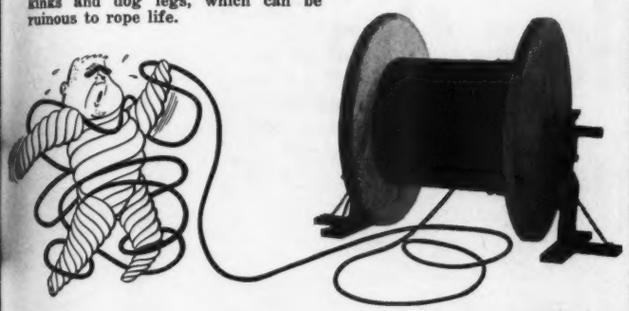
James P. Russomano was the chief engineer and Anthony Cammarta, the project engineer for Sanitary Sewer Associates. THE END

LeTourneau-Westinghouse adopts new trademark

"LW" is the new trademark that will appear on all earthmoving, construction, logging, and heavy material-handling equipment manufactured by LeTourneau-Westinghouse Co., Peoria, Ill. The trademark has been adopted to avoid confusion with other companies and products.

Rule 2: WRONG WAY to Set Up Reel for Unwinding

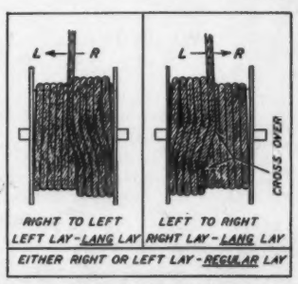
The rope is coming from the top of the reel and forming loops as it overruns. These loops are likely to form kinks and dog legs, which can be ruinous to rope life.



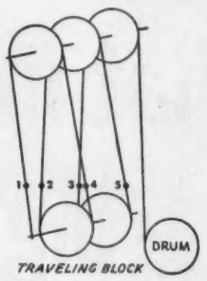
…pe for multiple layer winding: …hen a rope winds in the first layer …ross the face of a drum, it usually …rms a uniform helix. On reaching …e flange of the drum, the rope rides …on the last turn and starts wind…g back across the face of the drum, …t falls into the depression of the …ccessive turns of rope on the first …yer.

…dvancing across the drum on the …cond layer, the rope, following the …pressions of the first layer, ac…ally winds back a turn in each …volution of the drum. It must then …oss over two depressions of the …st layer to have a net advance of …e turn per revolution.

…is cross over is unavoidable on the …cond and succeeding layers. Severe …nishment of the rope results, due to abrasion of the adjacent turns against each other, and the crushing from the next layer above at these points. Parallel-grooved controlled cross-over drums minimize this condition.



Rule 3: How to Figure Reeving Loads



Reeving ropes through the sheaves multiplies the number of parts supporting the load. The lead line to the drum carries the weight of the load lifted, divided by the number of parts, plus the accumulation of friction on all sheaves.

To count the number of parts supporting the load, draw an imaginary line across the parts of the rope supporting the load.

The efficiency of reeving systems ranging from one to eight parts is shown in charts which Union Wire Rope engineers make available to users.

Rule 5: Use the Tuffy Special Purpose Wire Rope "Tailored" to a Specific Application

…re was a time when just any size and lay of rope was …from a stock reel and used for just about any kind of …rvice. It's different today. The various constructions of …ffy Ropes are precisely fitted to each type of use.

…re are thousands of different wire rope constructions. …ion Wire Rope makes them all. But there's only one …ffy line of ropes. Each Tuffy is the right rope and the best rope for the particular work for which it was developed. Each is "job prescribed". Each has the right balance of strength, flexibility and toughness to give you longest service, greatest efficiency and safety.

Union Wire Rope Corporation, Subsidiary of Armco Steel Corporation. Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand. 2260 Manchester Avenue, Kansas City 26, Mo.

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UNION Wire Rope

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3

For more facts, use Request Card at page 18 and circle No. 311

Surveying Washington

by E. E. HALMOS, JR.

Corps, Reclamation bureau agree on water-resource development

If you're working in heavy construction involving either the U. S. Army Corps of Engineers or the Bureau of Reclamation, or both, you'll be interested in the terms of an agreement worked out between the two agencies and the state of California concerning water-resource developments in the Central Valley. The agreement, a result of a long-term study, amounts to a truce between the various agencies and is expected to set a pattern for other areas.

The federal agencies agree to cooperate with the state and keep its agencies informed of their activities, deferring to the state whenever possible. The Bureau of Reclamation will be responsible for contracting for all irrigation services; the Corps of Engineers will take the initiative to provide for needed navigation and flood control; and all surveys and planning activities will be coordinated.

Specifically, the jurisdiction for completion of planning, seeking authorization, construction, and operation gives the Bureau of Reclamation full charge of one California project—Auburn on the American River. The Corps takes full control of six projects: Black Butte on Stony Creek; New Hogan on Calaveras River; Buchanan on Chowchilla River; Hidden and Terminus on Fresno River; and Success on Tule River.

New Fallon measure to aid highway funds

An important first step toward straightening out the impending mess in the federal highway program, due to shortage of funds, is embodied in HR 5950, introduced by Rep. George H. Fallon (D., Md.)

The measure would approve BPR's 1958 cost estimates as the basis for making the 1962 apportionment, and would increase the 1962 fiscal-year authorizations from $2.2 billion to $2.5 billion.

Advocated by ARBA and other interested groups, the bill will not solve the cash-shortage problem, but it is regarded as a step in the right direction. If passed, it would be in fact a new authorization for spending, thus expressing the intent of Congress that revenue be found to carry on the program.

Passage of the bill would reflect the acceptance by Congress of the realistic viewpoint of the BPR, and of the fact that costs have risen about 37 per cent since the program was inaugurated in July, 1956, on the basis of 1955 figures. Most of the rise has gone into engineering and right-of-way, plus the great number of additional access roads and facilities added to the program since its inception.

Bill to help contractors plan work on public buildings

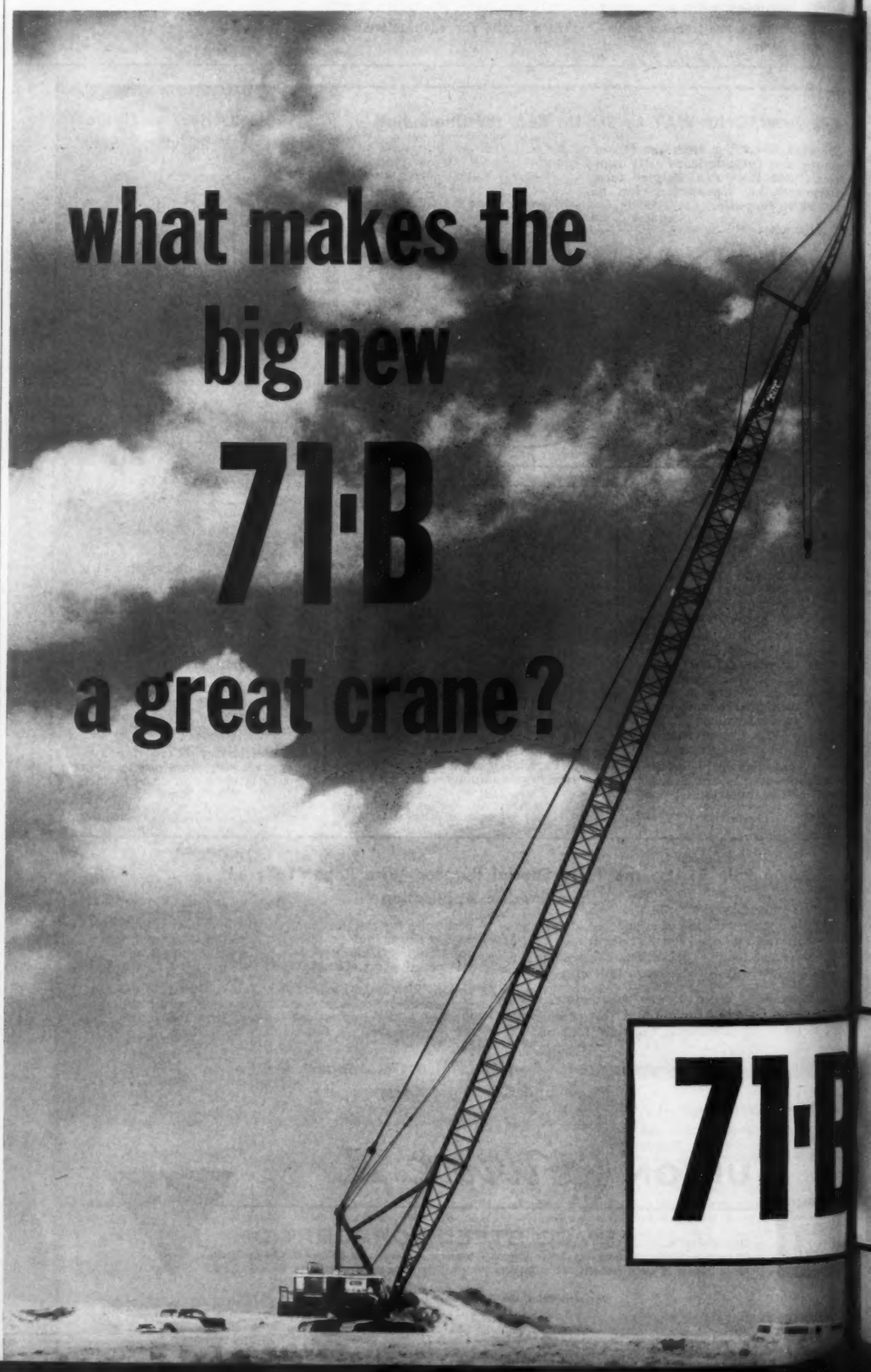
A bill that might make it easier for contractors to plan for work on public buildings went into the Senate hopper early last month. Authored by Sen. Eugene J. McCarthy (D., Minn.), the measure would limit the number of public buildings that can be authorized to a percentage of the money appropriated to pay for them. McCarthy pointed out that "thousands" of buildings were authorized under the 1949 Public Buildings Act, but in most cases no funds have ever been made available to build them.

The bill provides that no more than 15 public buildings outside of the District of Columbia can be authorized without accompanying appropriations to start construction. However, if five structures of the 15 were put on the construction list, five more could be added to the authorization list

New book helps those dealing with the NLRB

There is a good book now available to help those dealing with the National Labor Relations Board.

"How to Take a Case Before NLRB" is by Louis G. Silverberg, now NLRB's director of information and a board employee for 20 years. The 386-page



volume sells for $7.85 a copy, and is published by the Bureau of National Affairs, 1231 24th St. N. W., Washington, D. C.

Limit on oil imports may boost asphalt prices

Asphalt prices could go up shortly. Producers say that if they do, you can blame it on the recent Presidential order, now hotly contested in Congress, limiting import of oils from foreign sources. In fact, watch for an injunction suit in the federal courts seeking to stay the order itself.

The order favors domestic producers of the heavy crude oil used for asphalt manufacture. There is no shortage of such crude oil in the United States; in fact, many producing areas have been limiting production in order not to depress the market. But asphalt people are afraid that higher production costs in the United States will be a factor in pushing up prices.

Good leads for future jobs in HEW and HHFA projects

In searching for new business, don't overlook the Department of Health, Education and Welfare, and the Housing and Home Finance Agency as good leads. Quietly, and in relatively small individual amounts, these two agencies are putting out a lot of construction money each week.

For instance, HEW recently put out 45 grants to colleges and universities, totaling $5 million, to build and equip new research facilities.

HHFA has three branches that put out money resulting in construction work. Chief of these are the Urban Renewal Administration and the Community Facilities Administration. Daily, both of these hand out money to communities, admittedly in small driblets, for work that will entail immediate construction.

Community Facilities grants are much smaller—such as the $18,000 that went recently to Chicopee, Mass., for planning a new high school, or the $6,500 to Clarkstown, N. Y., for planning a sewerage and sewage-treatment plant. But the grants presage bigger construction work.

Have your lawyer check this partnership case

If you are operating under a partnership agreement, it will pay you to get your lawyer to look up a recent case in the U. S. Tax Court—31 TC No. 124.

The case is fantastically involved, but it boils down to this: five North Carolina residents joined together back in 1951, formed a partnership to enter the construction business, and contributed funds ranging from $250 to $750. Then they bought a piece of land, obtained a construction loan of $1.1 million, and built an apartment building.

They paid themselves salaries, largely out of the loan, prorated to the percentage of the original capitalization that they had contributed. One partner drew $49,000 (round numbers), and two others drew $24,000 each. On the books, the firm treated these salaries as expenses, and the partnership showed a net loss of $114,000 for the year. The partners then allocated this loss among themselves, offsetting the loss against the salaries for income-tax purposes.

The court held that the amount received by one partner is taxable to him, except for the portion that represented a return on his capital investment; and that he is entitled to a deduction (on the net loss) only to the extent that his capital contribution was applied to payments to other partners.

Subtract a top investment of $750 from the salaries, rather than a loss of about $20,000, and you get a sizable added tax bite.

Plan to raise grants for water-pollution control

One work-making bill, now under consideration in Congress, has a very good chance of getting through before the session ends. That would be the plan of Rep. Blatnik (D., Minn.) to raise grants for water-pollution control to a $100 million yearly loan program.

There is powerful backing for this proposal. Not the least is the Water Pollution Control Advisory Board, which advises the Department of Health, Education and Welfare. This board recently completed a survey of all states and territories and produced some pretty overwhelming ammunition for proponents of more money. Thirty-eight of the states favored doubling the grants, with only 13 opposed; 48 opposed elimination of federal grants; 44 said they were satisfied with progress to date toward a solution of interstate pollution-control problems and wanted the work to continue.

However, that does not agree with testimony of the National Association of Manufacturers, which proposed that the federal government get out of the loan business, in this matter, and leave developments to state and local agencies.

Performance makes it great!

This crane has more of the features you want to keep jobs *ahead* of schedule — more of the features that make erection jobs *really* profitable! Take a look — the 71-B, with its new tubular boom and jib, will reach a long 230 feet up! It combines this kind of reach with brute strength to give you an ideal lift combination.

NEW BOOM HOIST *SMOOTH AS SILK* . . . even with the biggest loads! It's fully independent of other operations, has power-controlled lowering and hoisting. The lowering disc-type clutch is a *new feature* — it's smoother when engaging and releasing.

FULL AIR CONTROLS OPERATE EASILY ON THE 71-B! The operator engages clutches, swingers, boom hoist — all with finger-tip ease. To keep the "feel" so necessary to good operation, graduated valves are used on main operating clutches.

THE 71-B's A GROUND HUGGER! Stability makes a key difference on BIG lifting jobs because a steady machine turns out measurably greater production. Weight of the 71-B is spread out over these long crawlers to make the rig rock solid!

THESE ARE JUST A FEW OF THE REASONS why the 71-B is an outstanding big crane. Get the facts from your Bucyrus-Erie salesman . . . have him demonstrate the 71-B and see the features that will make your lifting jobs more profitable.

For more information, write Dept. 11ED, Bucyrus-Erie Company, South Milwaukee, Wisconsin.

THIS NEW BOOM IS *LIGHTER — STRONGER*

The new tubular boom (available on 71-B) is lighter. You can use boom and jib combinations up to 230 feet. Bigger cross section makes the boom more stable.

BUCYRUS ERIE®

Builds Better Equipment

BUCYRUS-ERIE COMPANY
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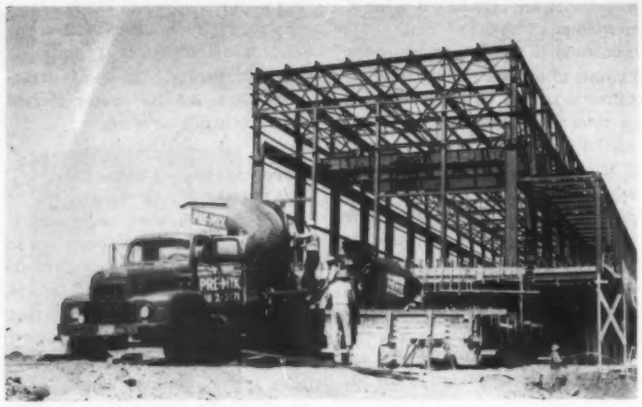
For more facts, circle No. 315



At the site of a new pulp and paper mill at Wallula, Wash., an International-mounted Challenge mixer and a Jaeger mixer chute concrete into forms for a 5-inch-thick wall slab. Slabs, stacked in groups of 11, are being used for the exterior facing of the buildings.

Heavy tilt-up slabs set as exterior facing for steel-frame buildings

Precast-concrete wall panels were placed as high as 30 to 50 feet above the ground for a new $15 million pulp and paper mill at Wallula, on the Columbia River in southwestern Washington. While these panels were cast and handled somewhat like the common tilt-up type, they make up the exterior facing of the multistory steel-frame buildings in the mill complex.

The mill was built for Cascade Kraft Corp., a subsidiary of Boise Cascade Corp., Boise, Idaho, by Swinerton & Walberg Co., San Francisco. Its location below Pasco near the Oregon line is close to several large lumber mills. Waste wood from these mills, which was previously burned, is now converted to chips, hauled to Wallula in special trailers and end-dump hopper cars, blown to the pulp mill, and processed into paper.

About a third of the output of this plant is being absorbed by Cascade Kraft's corrugating plant, which is located on an adjacent site.

The largest buildings in the group are the pulp and paper plants, which are actually a single structure 600 feet long, 47 to 60 feet wide, and up to 80 feet in height—the equivalent of a six or seven-story building. Other structures include a boiler-recovery building, measuring 83×47 feet and rising 95 feet high; single-story office and maintenance buildings; facilities for unloading, stockpiling, and transporting chips; and a recausticizing unit consisting primarily of a series of tanks around the boiler building.

Structural-steel framing

Footings for the big buildings were excavated by a Gradall. The moist sand stood well enough so that the Gradall could cut the footings to neat lines and concrete could be placed without forms. Because of its ability to work to close tolerances and to excavate even the corners of the footing holes, the Gradall saved a great deal of time and labor on this phase of the work.

The heavy structural-steel frames

MARVEL Synclinal FILTERS

FOR DEPENDABLE PROTECTION on Construction Industry's Hydraulic Equipment

LINE TYPE (Cutaway)

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Hydraulic Oils MUST BE CLEAN

To Protect Equipment — Increase Production — Reduce Maintenance

CONSTRUCTION ENGINEERS and MAINTENANCE MEN, whose job it is to keep machinery operating at peak efficiency, are specifying Marvey Synclinal Filters on new equipment and standardizing with Marvel's on existing equipment.

OVER 800 Original Equipment Manufacturers install MARVEL SYNCLINAL FILTERS as standard equipment for dependable protection on all hydraulic and other low pressure circulating systems.

IN-LINE FILTER

Handles up to 25 G.P.M. of hydraulic oil at very low pressure drop. Monel wire cloth filtering media is available in mesh sizes from 30 to 200. Cartridge is easily removed for cleaning.

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EASY TO CLEAN

Both sump and line types are easily disassembled, thoroughly cleaned and reassembled, on the spot, in a matter of minutes. Line type operates in any position and may be serviced without disturbing pipe connections.

A SIZE FOR EVERY NEED

Sump or line type filters in capacities from 5 to 100 G.P.M. Greater capacities attained by multiple installation. Monel mesh, sizes 30 to 200.

IMMEDIATE DELIVERY

For further information, write, wire, phone or use coupon below.

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Catalogs containing complete data available on request

Without obligation, please send me complete data on Marvel Synclinal Filters, as indicated:

- ☐ Catalog #108—For Hydraulic Oils, Coolants, Lubricants
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- ☐ Catalog #301—For Water

CE-5

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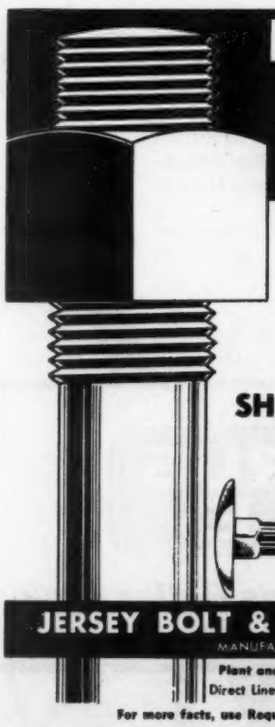
For more facts, use coupon or Request Card at page 18 and circle No. 316



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Made of Steel or Genuine Wrought Iron to your specifications

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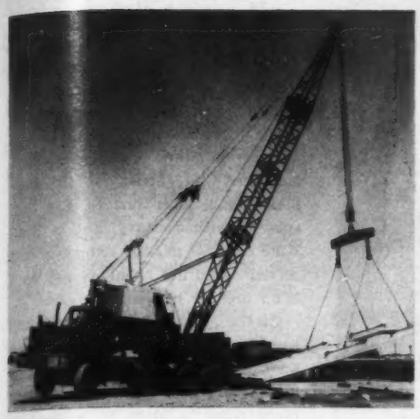


A Lima 25-ton motor crane lifts one of the tilt-up wall slabs for the boiler building. As the slab breaks loose, the crane's front wheels are lifted off the ground. But the operator booms up so that the slab comes to a vertical position close to the crane. The slab is then transported in this position to the building. As the crane sets the panel in place, clips are welded to the steel frame. Hobart welding generators, foreground, supply current for welders.

of the buildings were furnished and placed by Isaacson Iron Works, Seattle. Some 40,000 pieces of steel, weighing a total of 1,200 tons, were placed by an American 30-ton motor crane using an 85-foot boom and 30-foot jib. Probably the toughest lift was a 6-ton section that had to be raised 100 feet in the air. All connections in the structural-steel frames were made with high-tensile bolts.

While the frames were being erected, many of the subcontractors were busy installing utilities, tanks, and other large and heavy plant elements. The big boilers were furnished and installed by C. C. Moore, San Francisco. Tanks for caustics and other liquids were supplied and erected by Hydraulic Supply Mfg. Co., Seattle. The Hydraulic Supply crew used a Lorain 25-ton motor crane with 60 feet of boom and 15 feet of jib to set up the tanks.

General mechanical subcontractor was Elmco, San Francisco. Reinforcing steel was furnished and placed by Soule Steel Co., Portland, Ore. Paper-mill machinery in the plant was supplied by Black & Clawson. About 2,000 feet of railroad track, supplying the plant dock and the chip-handling facilities, was installed under a separate prime contract.

Fifteen special freight cars were built to carry the chips. These big cars have a gate at one end. The car-dumping device at the chip yard raises the cars so that the chips flow out one end of the car into a receiving hopper. From here they are blown to stockpiles. Then they are removed on conveyors and delivered to the pulp mill.

Panels cast in stacks

Long before the steel frame was complete, Swinerton & Walberg began casting the concrete wall panels. At convenient points around the buildings, stacks of the panels were cast one on top of the other.

Transit-mix trucks of Premix Concrete Co., Kennewick, Wash., deliv-

(*Continued on next page*)

Fast-Driving, Versatile

VULCAN
DGH-100
PILE HAMMER
speeds work on sewer project

The Vulcan DGH-100 Portable, Differential-Acting Hammer is driving 3" x 8" x 24' timbers to a depth of 20 feet to form bins 8' wide and 24' long used in the construction of a sewer line in Edina, a suburb of Minneapolis. Contractor: Phelps-Drake Co., Minneapolis. The Vulcan DGH-100 is a favorite with contractors everywhere.

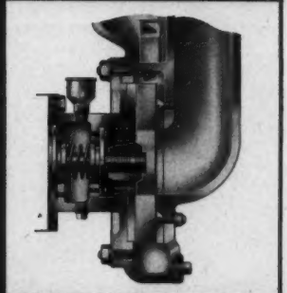
Ask for full information

Manufacturers of Pile Driving Hammers and Piling Extractors Since 1852

VULCAN IRON WORKS INC. 327 North Bell Avenue, Chicago 12, Illinois

For more facts, use Request Card at page 18 and circle No. 318

ESSICK
SELF-PRIMING PUMPS



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30M PUMP

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CONTRACTORS SAY:
"IT'S THE SEAL AND THE IMPELLER THAT MAKE THE PUMP"

ESSICK AUTOMATIC DUAL SEAL*
The Dual Seal . . . field tested on thousands of operating pumps, is now recognized by large pump users as the most outstanding contribution to pump design.

*Seal failure can be the difference between profit and loss on your project . . . Essick pumps, with the Automatic Dual Seal, ensure 24 hour per day dependable pumping.

ESSICK NO-CLOG TRASH HANDLING IMPELLER**
Specially designed open-vane, balanced impellers, guaranteed to pass spherical solids equal to 25% of inlet diameter, are featured in Essick Pumps. The impeller eye is of ample diameter to pass material which easily clears through the extra wide vane passage ways.

**Trouble-free operation with no-clog assurance and self-cleaning action, is automatic in all Essick Self-Priming Pumps.

A COMPLETE LINE OF CONTRACTORS PUMPS FROM 4,000 GPH TO 240,000 GPH INCLUDING DIAPHRAGM PUMPS, HIGH-HEAD PUMPS, AND BELT DRIVE OR DIRECT CONNECTED PUMPS FOR ELECTRIC MOTOR OR GASOLINE ENGINE DRIVE.

SEE YOUR ESSICK PUMP DEALER FOR A DEMONSTRATION

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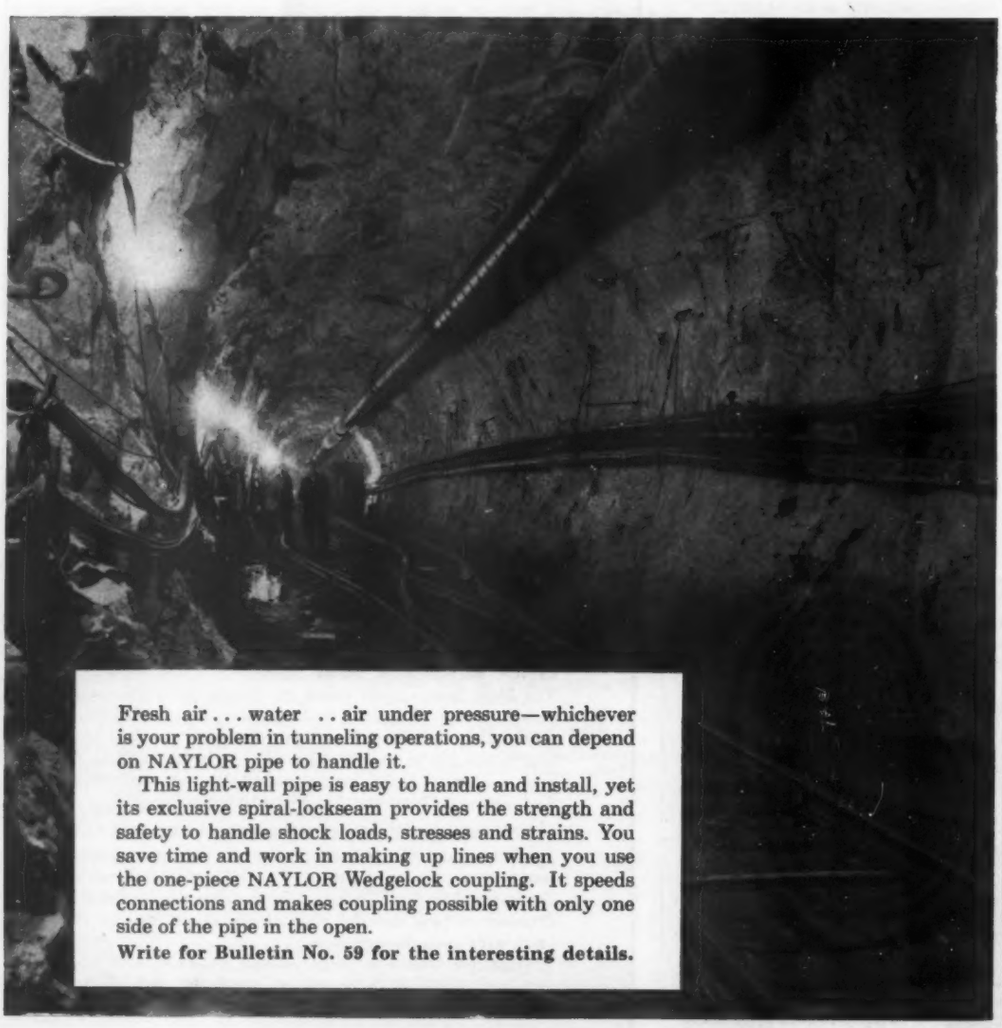
For more facts, use Request Card at page 18 and circle No. 319

Tanks in the recausticizing area next to the power house are being erected by Hydraulic Supply Mfg. Co., Seattle, with the help of a Lorain 25-ton truck crane. The crane uses a 60-foot boom and 15-foot jib.

Not far from the boiler house, finish grading is being done around partly completed plant facilities. The Cat 955 Traxcavator uses a side-dump bucket to load excess material into an International L-170 dump truck.

You Can Take It With You ...Underground!



Fresh air . . . water . . air under pressure—whichever is your problem in tunneling operations, you can depend on NAYLOR pipe to handle it.

This light-wall pipe is easy to handle and install, yet its exclusive spiral-lockseam provides the strength and safety to handle shock loads, stresses and strains. You save time and work in making up lines when you use the one-piece NAYLOR Wedgelock coupling. It speeds connections and makes coupling possible with only one side of the pipe in the open.

Write for Bulletin No. 59 for the interesting details.

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For more facts, use Request Card at page 18 and circle No. 320

(Continued from preceding page)

ered the concrete to the site, and much of it was chuted directly into the forms. As one of the 5-inch-thick slabs was cast, the placing crew moved to the next stack while finishers, using a Superior power finishing machine, smoothed the surface of the completed slab. This surface was then sprayed with a heavy coat of Kon-Kure concrete parting compound that served as curing agent as well as a bond breaker between the slabs.

On the following day, the form was raised an additional 5 inches, and another slab was cast on top of those already in place. This continued until there were 11 slabs in a stack of standard sections. Fewer slabs were cast in some of the stacks of special sections.

The slabs intended for use on the high sections of the walls were cast with a lightweight concrete to hold down their weight and make them easier to handle. Slabs for the lower levels were cast of standard concrete.

Set by cranes

Superior lifting accessories were cast into the slabs, and corresponding attachments were used by the cranes that lifted and placed the panels. Most of the ground-level panels were set by a Lima 25-ton truck crane. Since some of the larger of these panels weighed up to 21 tons, this small crane was sometimes strained to the limit.

On these heavy lifts, the crane had a 6-part line attached to a heavy strongback. Cables from the lifting attachments on the slabs were run through sheaves on the ends of the strongback so that, as the slabs were raised, the angle of the slabs could change from horizontal to vertical.

The initial lift sometimes pulled the front wheels of the truck crane off the ground, but the machine quickly settled down, for the operator was able to boom up and get the slab in a vertical position close to the crane. The crane carried the panels in this position to the building and set them in place. Workmen quickly welded steel clips to the structural-steel frame to hold the slabs in place, using Hobart portable generators to supply the welding current.

Although the higher panels were cast of lightweight concrete, the additional height and reach required a

An American 30-ton motor crane with 85-foot boom and 30-foot jib erects steel members for the frame of the digester building.

larger crane. S&W rented a Manitowoc 40-ton truck crane from Lampson of Kennewick to set the high panels. The lower concrete wall panels rest on a grade beam, and upper tiers rest upon the lower ones. Thus none of the weight of the walls is carried on the steel building frame, but the frame provides the lateral support for the panels.

In some of the very high portions of the structure, especially on setbacks, the walls were sheathed with corrugated asbestos sheathing.

Personnel

Superintendent Jim Wade supervised the project for Swinerton & Walberg Co. On his staff were engineers Joe Urso and P. J. West, safety engineer Melvin Berry, and office manager George Fluitt. Superintendent Bill Lawson supervised the steel erection for Isaacson Iron Works, and Francis Rich served as rigging superintendent for Hydraulic Supply Manufacturing Co.

The entire construction operation was supervised for the owner, Boise Cascade Co., by engineer Ray M. Millbach. THE END

Pavement density; bridge research at AASHO road

Special Report 38, "Gamma Ray Measurement of Pavement Density and Bridge Research Program at the AASHO Road Test," is available for $1.20 from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

The first part of the book describes the AASHO Road Test system of nuclear-density determination and discusses the sources of error that have been isolated and, in some cases, eliminated. Some of the considerations in the design of nuclear surface gages are discussed, as well as calibration techniques, licensing, health precautions, and cost. An appendix states in nontechnical language the principles involved in nuclear determination of density.

The paper on bridge research summarizes the construction of 16 single-lane, single-span highway test bridges located in the regular traffic lanes of loops C and D, the heaviest traffic loops in the AASHO Road Test. Eight steel I-beam bridges—four designed to the yield-point stress of the steel and four to 27,000 psi—are included along with four conventional and four prestressed-concrete bridges. This report gives data on the construction control program, instrumentation for the bridges, and plans for the research program before, during, and after the regular test traffic phase of the Road Test.

Diagrams, pictures, and tables abound.

GE communications news

George F. Arnold has been named district sales manager for the Cleveland office of General Electric Co., Communication Products Department, Lynchburg, Va. Arnold replaces M. S. McIlwain, who has been transferred to Lynchburg.

For more facts, circle No. 321→

Welding line exhibited by Air Reduction Sales

Key welding-product groups were exhibited early last month by Air Reduction Sales Co., Division of Air Reduction Co., Inc., New York City, at the American Welding Society's 1959 exhibition in the International Amphitheatre, Chicago. The company demonstrated the dip transfer carbon dioxide welding process for all-position welding of steel; a three-tube oxyacetylene hand cutting attachment; and the No. 48 Duograph flame-cutting machine.

Many of the firm's new or refined products developed during the past year were displayed, as were the complete lines of Aircomatic and Heliwelding equipment.

Spanish firm makes Koehring excavators

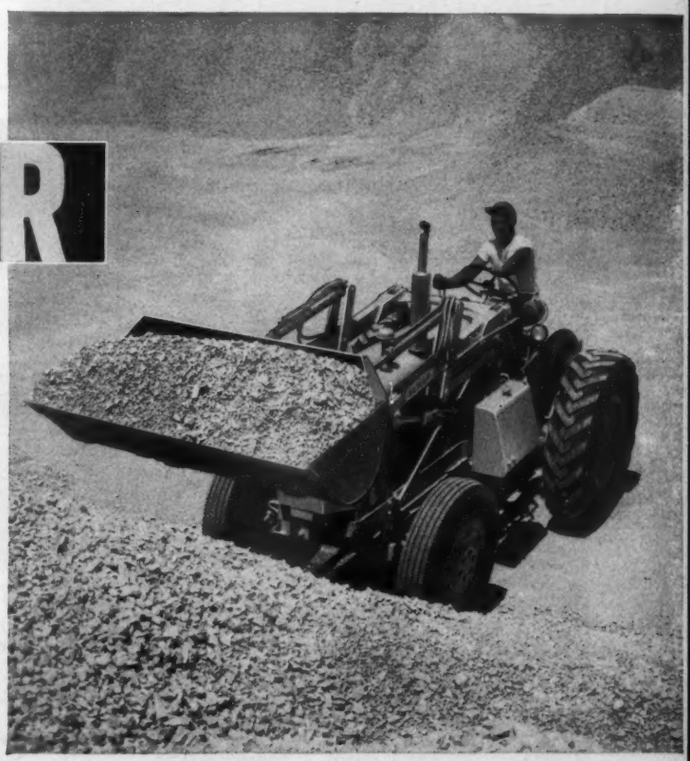
Kynos, S. A., Madrid, Spain, is now producing Koehring ¾-yard excavators for the Spanish market and the country's African possessions. It will also manufacture Kwik-Mix and C. S. Johnson products. Kynos' new 80,000-square-foot plant includes welding and machine shops and assembly areas.

Glen Canyon Dam film

"Canyon Conquest," a 16-mm sound and color film from the Bureau of Reclamation, tells the story of the first two years of construction at the Glen Canyon Dam site. The 20-minute film is available for showing to any group. There is no service charge, but the user must pay the return postage.

The film may be obtained from the Office of the Commissioner, Bureau of Reclamation, Washington, D. C., or from the Regional Director, Bureau of Reclamation, Salt Lake City, Utah.

OLIVER



—let us demonstrate on your jobs!

You be the taskmaster—tough, demanding and with the "I'm from Missouri" attitude.

We're looking for the critical user, to show what these *new* Oliver tractor-loaders can do—*all they can do* to get your digging-loading cycles up, job costs down, and bring in better income returns over the long haul!

Just tell us where and when. We'll put the Oliver of your choice on the job you name. You work it, actually earn with it for a demonstration that we sincerely believe will open your eyes to the progress that has been made in tractor-loaders by Oliver.

Set up your "free sample" of Oliver work-power in action. Call your Oliver distributor now for a demonstration. Absolutely no obligation of any kind, of course.

TRY THIS "FREE SAMPLE" OF OLIVER WORK-POWER

3 on rubber! Choose from the Oliver 12-cu.-ft. Model 558... ¾-cu.-yd. Model 778 ...1-yd. Model 888. The last two are available with Oliver's famed "Reverse-O-Torc" transmission, which gives you instant, finger-tip reversing without shifting or clutching. All are today's newest wheel loaders—fast, agile and full-powered, with engine and hydraulics matched to perfection to lift, dig and move materials faster, easier.

3 on crawlers! If a crawler loader is your need, select from this 3-loader line-up by Oliver—all with "Spot-Turn," wet clutch steering. Try the Oliver OC-46, most rapid-performing loader in the ⅝-yd. size. Look at the Oliver OC-126, the 1½-yd. standout. In the big 2¼-yd. loader class, the new Oliver OC-156 is the most modern of its size. And you get extra value by working *any* Oliver tractor-loader with a variety of attachments.

Don't let old buying habits keep you from knowing all that's new with Oliver. Arrange a demonstration now!

THE OLIVER CORPORATION

Industrial Div., 19300 Euclid Ave., Cleveland 17, Ohio

A complete line of industrial wheel and crawler tractors and matched allied equipment

"Anyone with the mentality of a six-year-old can operate it. Just jump in the driver's seat and I'll prove it to you."

ARBA issues bulletins

Two new technical bulletins have been issued by the American Road Builders' Association. "Welded Wire Fabric Reinforcement in Asphaltic Concrete Overlays," Bulletin No. 233, is a summary of recommended practices relating to styles and sizes of welded-wire fabric, asphaltic mixtures and aggregate sizes, minimum thicknesses, and installation procedures. This bulletin is by Edward M. Howard, field engineer of the Wire Reinforcement Institute.

Bulletin No. 239, "Lime Stabilization Expedites Construction of SAC Jet Runway," reports on the use of hydrated lime to stabilize a heavy clay subgrade under pavement at the Bergstrom Air Force Base, Austin, Texas.

The bulletins are priced at 50 cents each and can be obtained from the ARBA, World Center Bldg., Washington 6, D. C. ARBA members are entitled, upon request, to one free copy of each bulletin.

Firm organized to market American Air Filter units

Two New York State representatives for American Air Filter Co., Inc., Louisville, Ky.—Paul H. Chartres of Albany and William L. Jacobs of Schenectady—have combined operations. The two men have merged their firms to form the Air Equipment Co., 1-A Lincoln Ave., Albany, N. Y. This company is the AAF sales outlet in the upstate New York area.

With the creation of the new firm, Pierce F. Chartres, who had been associated with AAF for 34 years, retired from active participation.

USED BY MEN WHO BUY EQUIPMENT FOR WHAT IT SAVES

Easiest Way to do Hardest Pumping

It doesn't matter where you pump or what you pump, the Homelite Diaphragm Pump is the Time-saver and Money-saver for continuous heavy-duty work. Weighs only 120 pounds, complete with Homelite quick-starting engine . . . less than ½ the weight of most diaphragm pumps of equal capacity. You set it up anyplace, fast. You do your pumping, fast. Handles anything . . . water, sand, mud, muck, solids. Manual throttle control adjusts engine speed for full 5,000 G.P.H. capacity pumping or handling small seepage flow . . . gives greater fuel economy. Suction lift of 28 feet is guaranteed. You get total heads up to 50 feet, including friction. Flapper valves have special self-cleaning action to prevent clogging. For longer wear, gears operating in oil are totally enclosed. For steady footing, pump is mounted on vibration-proof spring skids. See it in action today.

Homelite factory branches are located throughout the country. Your nearest one is as close as your phone. Call them or write for convincing demonstration or rapid service in any way.

HOMELITE
CARRYABLE
PUMPS GENERATORS • BLOWERS CHAIN SAWS

HOMELITE • A DIVISION OF TEXTRON INC., 9605 RIVERDALE AVE., PORT CHESTER, N.Y.
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For more facts, use Request Card at page 18 and circle No. 322

CONCRETE TESTERS

THE WORLD'S FINEST LOW COST PLANT AND JOB-SITE TESTERS For
CYLINDERS
CUBES
BLOCKS
BEAMS
PIPE

IF IT'S A CONCRETE TESTER YOU NEED-GET IN TOUCH WITH

FORNEY'S, Inc.
TESTER DIVISION
P. O. BOX 310 · NEW CASTLE, PA.

For more facts, circle No. 323

Expert B.F.Goodrich on-the-job service is as close as your phone

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ALBANY . . . . . ALbany 4-8115
BUFFALO . . . . . GRant 4040
EDEN—Vic Schrader Tire Service . . . . EMerson 6009
NEW YORK . . . . . JUdson 2-1030
NIAGARA FALLS . . . . . BUtler 5-1275
OLEAN 2-1232
POUGHKEEPSIE . . . . . GLobe 2-9030
ROCHESTER . . . . . GLenwood 3-2830
SYRACUSE . . . . . GRanite 6-4016
UTICA . . . . . REdwood 3-7536

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CHARLOTTE . . . . . EDison 3-4133
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NORTH DAKOTA

FARGO . . . . . ADams 2-7481

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WOOSTER—Streck Tire Company . . . HOward 2-6906

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ENID . . . . . ADams 4-5121
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OKLAHOMA CITY—Johnnie's Tire Co., Ltd. . . . . JAckson 9-4404
TULSA . . . . . LUther 5-1221
TULSA—Tom P. McDermott . . . . . DIamond 3-9188

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ROANOKE 4-3241
ST. PAUL—Tri-County Tire Service . . . RO 2-5301
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GRANDVIEW—Bill M. Vance . . . . . TUcker 2-8255
SEATTLE . . . . . MAin 3-6660
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PARKERSBURG . . . . . GArfield 2-6570
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LA CROSSE 6-5065
MADISON . . . . . ALpine 6-4802
MILWAUKEE . . . . . DIvision 6-6366

Enter the B.F.Goodrich Truck Tire Mileage Contest. You can win a Thunderbird, or Corvette, or one of 310 other prizes. See your B.F.Goodrich dealer today for entry blanks.

Specify B.F.Goodrich tubeless or tube-type tires when ordering new equipment.

For additional copies of this advertisement, see your B.F.Goodrich dealer or write *B.F.Goodrich Tire Co., A Division of The B.F.Goodrich Co., Akron 18, Ohio.*

B.F.Goodrich *truck tires*

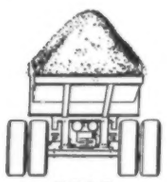
© The B.F. Goodrich Company

Watch out for overloading

Overloading reduces tire service—puts severe, often expensive, strain on other parts of the equipment. Carrying more than the rated load increases the danger of costly tire failures and disrupted work schedules. Make sure you know the proper load limits for your vehicles, and you will avoid these

Effects of overloading

1. Overflexing—breaks down tire cord body.
2. Greater impact when tire strikes an obstruction—more likelihood of cord damage.
3. Strained tire beads—resulting in complete tire failure.
4. Increased chance of cutting—rate of tread wear skyrockets.
5. Severe pounding action—causes tread and ply separation.



DIRT

With packed earth, weighing 2570 lbs. per cu. yd., these tires may not be overloaded. But with a similar load of marl clay weighing 3700 lbs. per cu. yd. tires would be overloaded.

COAL

Tires may be fully loaded with bituminous coal weighing only 1435 lbs. per cu. yd., but if other types weighing up to 2270 lbs. per cu. yd. are hauled, fewer cubic yards should be carried.

ROCK

Watch volume of loads. For example, shale weighs 2800 lbs. per cu. yd. and sandstone up to 4500 lbs. per cu. yd. Looks and actual weight of loads can be deceiving.

Check tire inflation regularly

Air pressure should be checked once a day if possible, but never less than two or three times a week. Check tires when they are cool. Examine valve cores for leaks. Pressure "buildup" is normal. If pressure goes 15 lbs. over normal, reduce load or speed. Never "bleed" air pressure build-up under operating conditions, especially in hot weather.

Results of overinflation

1. Cords are stretched, lose as much as 35 to 40% of their tensile strength—too weak to resist impact breaks.
2. Rubber is under tension and susceptible to cuts.
3. Tread ground contact area is reduced, speeding rate of wear.
4. Less contact area lessens flotation, reduces traction, requires more power.
5. Equipment is pounded to pieces, driver fatigue is increased.

Results of underinflation

1. Tires flex severely, build up excessive heat which may cause ply or tread separation.
2. Edges scuff over the road. Tread center buckles causing rapid shoulder wear.

OVERINFLATION

UNDERINFLATION

PROPER INFLATION

9 Tire Care Tips

Respect for equipment and a keen interest in keeping it in good condition are characteristics that make one driver better than another. Here are some pointers a good driver never forgets—pointers that lead to increased tire performance and lower tire cost-per-mile or per-hour.

DON'T SPEED

Off-the-road tires are designed for speeds up to 30 mph, depending on the load carried. Excessive speed results in fast tread wear and heat build-up.

DON'T PIVOT

Pivoting on one wheel causes tire body distortion that loosens cords, damaging both tire and tube. It also tends to twist foreign objects into the tread.

DON'T JUMP LOADS

Banging tires against a barrier to speed up unloading can cause serious tire damage. Tilt the load more and gravity will handle the unloading.

DON'T SPIN WHEELS

Every turn of a wheel without traction scrapes off good rubber and wastes engine power.

DON'T DRIVE OVER OBSTACLES

Avoid sharp rocks and other objects that can damage tires and cause premature tire failure.

DON'T SLAM ON BRAKES

Quick stops scuff off tread rubber. Anticipate stops — brake gradually.

AVOID OIL

Rubber soaked in oil, gas or grease deteriorates quickly. Avoid areas where these substances are prevalent.

DON'T RUB TIRES

Side banks are just as detrimental to off-the-road tires as street curbs are to passenger car tires.

DON'T KEEP SECRETS

Report any unusual condition of tires, vehicle or road surfaces. Inspect your vehicle regularly.

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Make sure you have the right tires for the work you do!

The right tires give you lowest cost per mile!

B.F.Goodrich makes a complete line of off-the-road tires—both tubeless and tube-type—in a full range of sizes and tread designs. Each tire is engineered to give longer service under certain types of operating conditions. Make sure the tires you use were designed for the work you do, because the right tires give you lowest cost per mile!

All B.F.Goodrich off-the-road tires are available with FLEX-RITE NYLON cord construction. FLEX-RITE NYLON withstands double the impact of ordinary materials, resists heat blow-outs and flex breaks. The B.F.Goodrich FLEX-RITE NYLON cord body outwears even extra-thick treads, can be retreaded over and over.

Rock Service

Newest, off-the-road tire on the market today prevents unnecessary tire failures. For mine, quarry and dirt-moving work. Regular, wide base and high tread types available. Sizes 12.00-21 thru 33.5-33.

Ribbed Logger

Running mate to the Rock Logger, this tire is designed for front or free-rolling wheels. May also be used on drive wheels where extreme traction is not needed. Sizes 9.00-20 thru 10.00-22.

All-Purpose

Designed for truck operators who use their equipment on both smooth pavement and dirt, gravel or mud roads. Up to 67% deeper tread digs in and pulls. Sizes 6.00-16 thru 12.00-24.

Rock Logger

For logging, transit mix and dump trucks, and the like. Use it in the rough and on short highway hauls. Ribbed tread and wire overhead types too. Sizes 10-22.5 thru 14.00-24.

Super Traction

Built for traction and flotation on power wheels of dirt-moving rigs working in sand, mud and soft dirt. Use tire in reversed position on free-rolling wheels. Sizes 18.00-24 thru 27.00-33.

Earth Mover Traction

This free-rolling tire is designed for scrapers, earth-moving wagons and heavy-duty pulled equipment. Gives modified traction too. Sizes 11.00-20 thru 24.00-29.

Tractor Grader

For drive wheels on road graders, motor patrols and tractors used in construction work, grading, road maintenance. Wide base and ribbed tread available. Sizes 9.00-24 thru 18.00-26.

There's a B.F.Goodrich tire for every off-the-road job!

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Operating conditions

The most important factor in operating conditions is the haul road. Proper planning of the road and work areas to prevent excessive braking and turning will save valuable time and cut tire costs.

Road maintenance

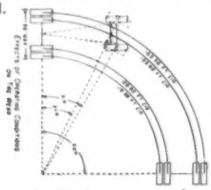
The road bed should be built and maintained free of severe depressions or chuck holes. Constant maintenance with a bulldozer or road grader will pay big dividends in reduced tire and equipment expense.

Tire clearance

Be sure tires do not rub against the body of the vehicle. Check regularly to avoid tire damage caused by loose or broken springs.

Water

Wet rubber cuts three to four times as easily as dry rubber. Eliminate water by ditching or pumping in areas where rubber-tired equipment is used.



The outside dual tire on a sharp curve travels considerably farther than the inside tire. It scrapes this extra distance.

Rely on expert on-the-job tire service to cut operating costs!

B.F.Goodrich Servicemobiles are equipped with hydraulic cranes, pneumatic wrenches, bead jacks and all the latest tools for on-the-job tire service—no matter how big the tire, how intricate the equipment, how complicated the job! B.F.Goodrich Service Men give you fast, expert service. Result: you save on downtime, eliminate unnecessary delays, reduce operating costs.

Tree stumps, boulders and other obstacles should be cleared from the haul road and working areas.

Be sure tire clearance is satisfactory at all times. Check for loose or broken springs which might damage tires.

5 no-obligation B.F.Goodrich services

Your B.F.Goodrich Tire Service Man will:

1. Inspect all your tires.
2. Point out tires that should be repaired or replaced.
3. Select tires for retreading by factory-tested and proved B.F.Goodrich methods.
4. Set up a proper inflation program.
5. Start you on a program of regular tire rotation and inspection.

Call the B.F.Goodrich store or dealer nearest you for all your tire and service needs

The B.F.Goodrich stores and dealers listed below are prepared to cut your operating costs and increase tire life with expert, on-the-job tire service. For a more complete listing in your area, consult the Yellow Pages of your phone book.

ALABAMA
ANNISTON . . . . . ADams 3-2571
BIRMINGHAM . . . . . FAirfax 3-0381
GADSDEN . . . . . Liberty 6-5271
HUNTSVILLE . . . . . JEfferson 6-2487
MOBILE . . . . . HEmlock 2-2681
MONTGOMERY . . . . . AMherst 2-1681
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PINE BLUFF . . . . . JEfferson 4-5123

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BELL GARDENS—Gardner Tire Sales . SPruce 3-2811
EUREKA . . . . . HIlside 2-5700
FRESNO . . . . . ADams 3-5216
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OAKLAND . . . . . HIghgate 4-2800
REDWOOD CITY . . . . . EMerson 5-4648
RICHMOND . . . . . BEkin 4-7771
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SAN BERNARDINO . . . . . TUrner 8-0847
SAN DIEGO . . . . . BEImont 2-3131
SAN FRANCISCO—Perry & Whitelaw, Inc. UNderhill 1-1801
SAN JOSE . . . . . CYpress 5-6050
SAN MATEO—Perry & Whitelaw, Inc. . Diamond 2-2051
STOCKTON . . . . . HOward 6-0081
VAN NUYS—Ben Rudnick Tire Co. . . STanley 3-2060
VISALIA . . . . . REdwood 4-6719

COLORADO
DENVER . . . . . KEystone 4-0175
PUEBLO . . . . . LIncoln 4-1063

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HARTFORD . . . . . JAckson 7-2121

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WASHINGTON . . . . . REpublic 7-5525

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FT. LAUDERDALE . . . . . JAckson 6-6662
JACKSONVILLE . . . . . ELgin 6-2801
LAKELAND . . . . . MUtual 2-0331
MIAMI . . . . . NEwton 3-0635
OCALA . . . . . MArion 2-4254
ORLANDO . . . . . GArden 2-3161
PENSACOLA . . . . . HEmlock 8-3181
ST. PETERSBURG 7-1197
TAMPA 8-0181
WEST PALM BEACH . . . . . TEmple 3-4181
WINTER HAVEN . . . . . CYpress 3-4323

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ALBANY . . . . . HEmlock 2-8491
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AUGUSTA—Bowen Bros. Hardware Co., Inc. . 4-3261
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POCATELLO—Construction Tire Service CEdar 3-5121

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CAIRO . . . . . MAin 88
CENTRALIA 5089
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DECATUR 5258
DU QUOIN—DuQuoin Tire Mart . . LInden 3-2134
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JACKSONVILLE . . . . . CHestnut 5-6194
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MOUNT VERNON—Ranmar's Standard Tire Co., . . 60
OLNEY . . . . . EXpress 3-2137
PEORIA 4-4181
QUINCY . . . . . EAldwin 2-4000
ROCKFORD 2-0519
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SPRINGFIELD 3-3613
VANDALIA 638
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KANSAS CITY . . . . . MAyfair 1-2265
KANSAS CITY—Missouri Valley Tire Co. MAyfair 1-8515
LEAVENWORTH . . . . . MUtual 2-2091
SALINA . . . . . TAylor 3-2271
WICHITA . . . . . FOrest 3-1294

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LEXINGTON 2-6877
LOUISVILLE . . . . . JUniper 5-4141
PADUCAH 5-5454

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BOGALUSA . . . . . REpublic 2-4284
GRETNA . . . . . FOrest 6-4371
LAFAYETTE . . . . . CEnter 4-8388
LAKE CHARLES . . . . . HEmlock 6-0847
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NEW ORLEANS . . . . . JAckson 3-0181
SHREVEPORT 3-3174

MARYLAND
BALTIMORE . . . . . BEImont 3-5800
CUMBERLAND . . . . . PArkview 3-3277
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SPRINGFIELD . . . . . RE 3-4800

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DEARBORN . . . . . LIncoln 1-4800
DETROIT . . . . . FOrest 6-4800
ESCANABA . . . . . STate 6-7300
FLINT . . . . . CEdar 5-4500
GRAND RAPIDS . . . . . GLendale 8-5400
JACKSON . . . . . STate 8-4535
KALAMAZOO . . . . . Firestone 3-3544
LANSING . . . . . IVanhoe 2-4601
PONTIAC . . . . . FEderal 3-4525
SAGINAW . . . . . PLeasant 3-4181

MINNESOTA
DULUTH . . . . . RAndolph 3-4107
MINNEAPOLIS . . . . . FEderal 3-7755
ST. PAUL . . . . . CApitol 2-3207
ST. PAUL . . . . . Midway 5-2202

MISSISSIPPI
BILOXI . . . . . IDlewood 2-6401
COLUMBUS . . . . . FAirfax 3-7139
GREENWOOD 70
GULFPORT . . . . . UNiversity 4-4812
HATTIESBURG . . . . . JUniper 6-6401
JACKSON . . . . . FLastwood 6-5512
LAUREL 4275
MERIDIAN 3-3738
NATCHEZ 3-1661
PASCAGOULA . . . . . SOuth 2-4451
VICKSBURG 183
YAZOO CITY 2994

MISSOURI
HANNIBAL . . . . . 137 & 138
JOPLIN . . . . . MAyfair 6-4141
KANSAS CITY . . . . . VAlentine 1-4777
MEXICO . . . . . JUstice 1-3663
POPLAR BLUFF—J. A. Parker Tire Co. . SUnset 5-3600
ST. CHARLES . . . . . RAndolph 4-5000
ST. LOUIS . . . . . FOrest 7-5000
SPRINGFIELD . . . . . UNiversity 4-2241

NEBRASKA
LINCOLN 3-4407
OMAHA . . . . . MArket 5000
OMAHA . . . . . JAckson 4321

NEVADA
WELLS—4-Way Service . . . . . SKyline 3-3331

NEW JERSEY
BRIDGETON 9-2700
CAMDEN . . . . . WOodlawn 4-5737
ELIZABETH . . . . . ELizabeth 3-4600

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ALBUQUERQUE . . . . . CHapel 3-5551

MORE

Scrapers work fast cycle on earth-fill dam project

A 2,750-foot dam in Yellow House Canyon, Lubbock County, Texas, will stretch from the far right along the haul road to the hill in left foreground. A heavily loaded Caterpillar DW21, left, rolls down the 20 per cent grade on its 1,600-foot haul to the fill, right.

Fast loading cycles and the use of prewatered borrow is speeding up construction of a 74-foot-high earth-fill dam in Lubbock County, Texas. This $789,470 project also calls for spillway and access roads. Sira-Payne & Lacon, a joint venture of Sira-Payne and Lacon Construction Co., both of Dallas, expects to have the job finished by early 1960.

The new structure will extend 2,750 feet across Yellow House Canyon. A Caterpillar D7 tractor is dozing 12,500 yards of humus soil from the wide river channel to provide a firm foundation. A 12-foot core trench is being excavated by a Northwest Model 6 dragline. This material is cast onto the humus soil for wasting downstream from Buffalo Lake.

Most of the embankment material comes from road cuts through the canyon walls. The 22-foot road, with 4-foot shoulders, cuts through the bluffs on 10 per cent grades to the top of the dam. Side slopes will be 2 to 1. About 194,390 yards will be pulled from the north cut; 206,402 yards from the south cut.

Excavation

Excavation started with a sidehill cut on the south bank. Although hauls are long to the northern half of the dam, it will clear the way for work on the 17-foot-deep, 138-foot-wide concrete spillway, and a 190-foot cantilevered concrete bridge across the spillway.

Excavation is being done fast; loads of loose, damp caliche are packed into five Cat DW21 No. 470 tractor-scrapers in 25 seconds by a Cat D9. The tractor-scrapers drop 135 feet down a 20 per cent grade on a 1,600-foot haul to the fill area, then return with 800 feet of adverse grade, completing a cycle in seven minutes.

To speed compaction, the contractor is prewatering all material. About 45,000 gallons of water per hour is pumped up the hillside from the lake and dumped at the top of the cut. It flows through the cut by gravity, bringing the caliche up to desired moisture level. Mud holes are no problem; the water soaks into the ripped caliche, providing damp material.

Excavation was temporarily slowed by an 18-inch-thick hard caliche cap a few feet underground. Shallow holes were punched in the cap by a drilling machine. Light Atlas dynamite charges cracked the hard material sufficiently to permit an Allis-Chalmers HD-21 to doze the material over the side.

Other work

Fill is dumped on the fly by the DW21's. Two Cat No. 12 motor graders spread the fill for compaction by a

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Save time and money finishing concrete

SYNTRON Vibrating Floats finish concrete five times faster and easier than by hand floating methods—permit the use of a drier mix. The power of their 3600 vibrations per minute can be adjusted to the density of the mass to produce stronger, safer, more durable concrete.

There are no mechanical wearing parts, assuring long, dependable operation with low maintenance.

Faster finishing reduces costs, increases production and profits.

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Other SYNTRON Equipment of proven dependable Quality

MASS CONCRETE VIBRATORS

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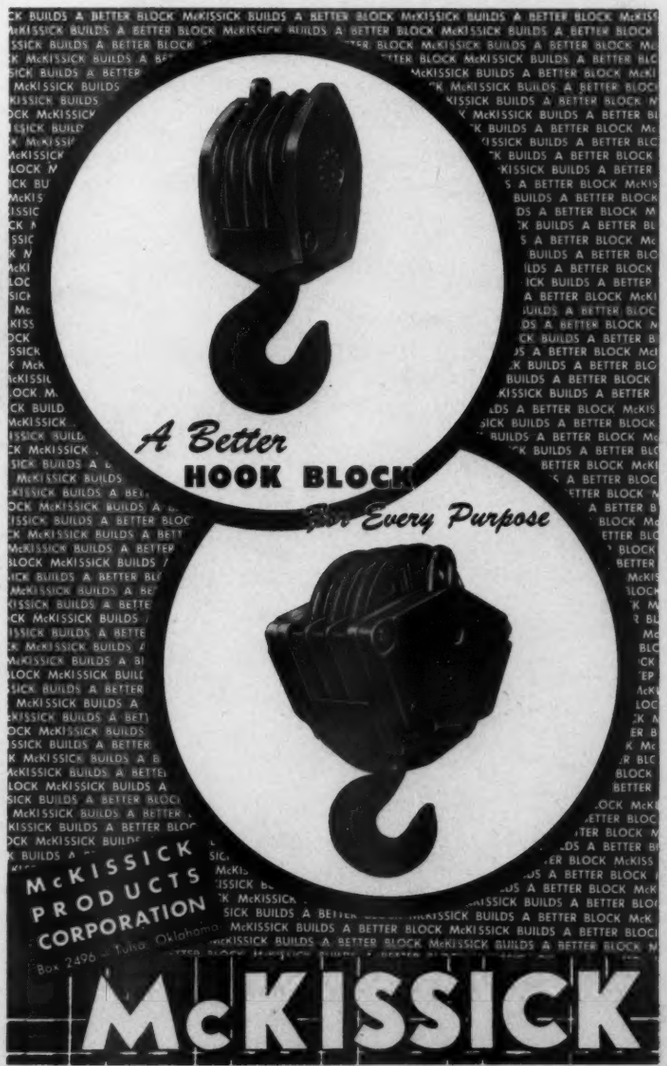
For more facts, use Request Card at page 18 and circle No. 325



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B.F.Goodrich

Smileage!

How to get more service from off-the-road tires

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XUM

Wet caliche is quickly brought to required density by the double-drum sheepsfoot roller pulled by a Cat D8 tractor and a 50-ton Bros pneumatic roller pulled by a Euclid S-18.

In an average of 25 seconds a heaping load of heavy moist caliche is pushed by a Cat D9 tractor into a Cat DW21-No. 470 tractor scraper. Sometimes the tractor-scraper helps break up the caliche with a ripper.

(*Continued from preceding page*)

double-drum sheepsfoot pulled by a D8 and a 50-ton Bros roller pulled by a Euclid S-18. The DW21's also dump into the core trench for compaction by another D8 with sheepsfoot roller.

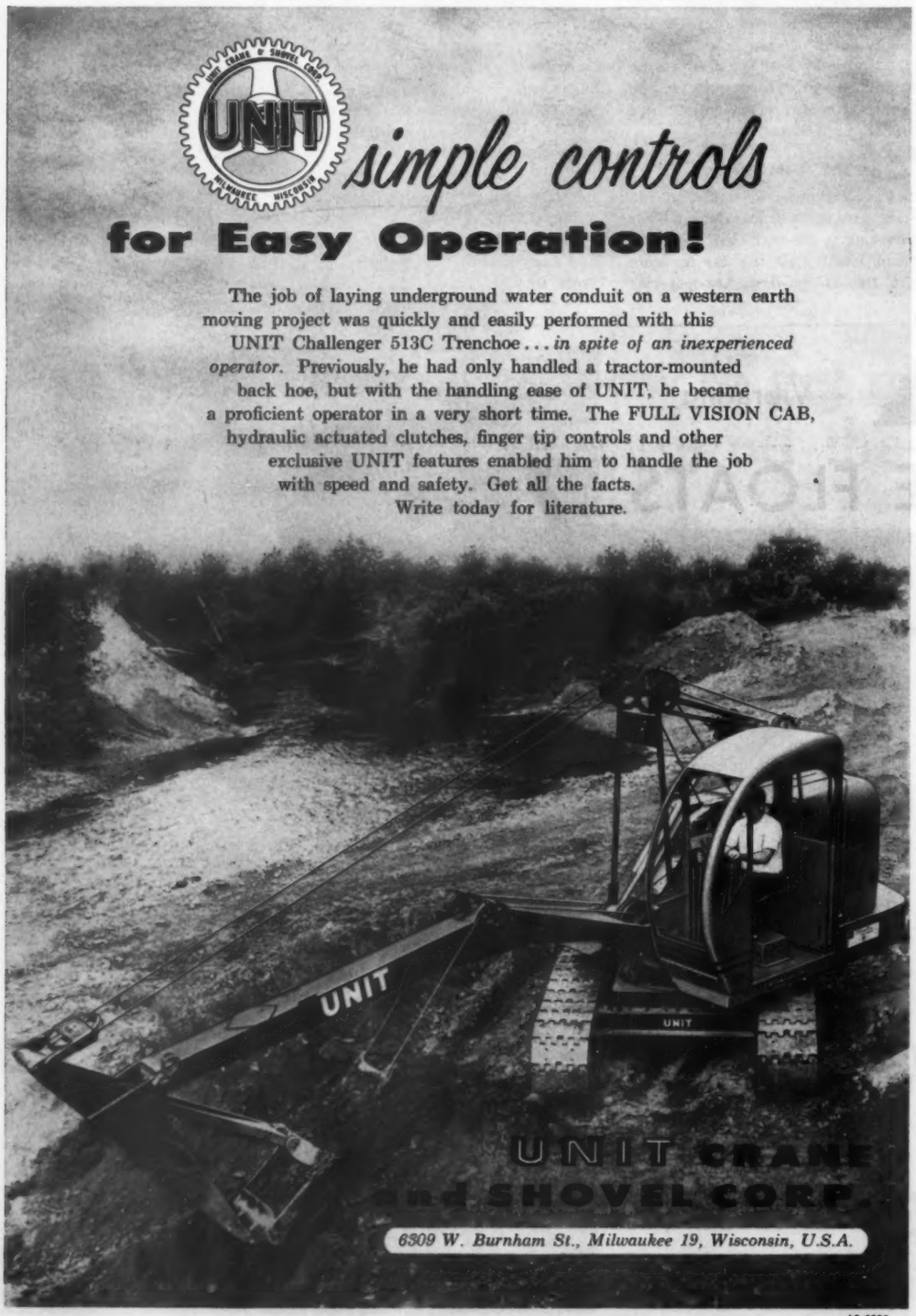
Buffalo Lake is formed by three small, shallow dams across Double Mountain Fork. The dams will be flooded eventually.

Most of the ripping is handled by a No. 18 ripper pulled by a Cat D8.

When completed, the 2,750-foot-long earth-fill dam will rise from elevation 2958 to 3032. Water level will be elevation 3015. The road will cross the 25-foot-wide top of the dam. Downstream slopes will be 2.25 to 1; upstream, 3 to 1. About 19,700 tons of riprap will protect the dam, while an additional 5,100 tons of riprap, placed 2 feet thick, will be spread over 6 inches of limestone in the spillway area. A 12-inch spun-steel concrete-lined pipe will carry water under the dam from the control tower.

The project also includes 476,200 yards of embankment for the reservoir dam; 81,600 yards of roadway; 21,100 yards of blanket; and 12,500 yards of waste. THE END

A drilling rig puts down shallow holes in an 18-inch cap of hard caliche in the south road cut.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simple controls
for Easy Operation!
The job of laying underground water conduit on a western earth moving project was quickly and easily performed with this UNIT Challenger 513C Trenchoe . . . *in spite of an inexperienced operator.* Previously, he had only handled a tractor-mounted back hoe, but with the handling ease of UNIT, he became a proficient operator in a very short time. The FULL VISION CAB, hydraulic actuated clutches, finger tip controls and other exclusive UNIT features enabled him to handle the job with speed and safety. Get all the facts. Write today for literature.
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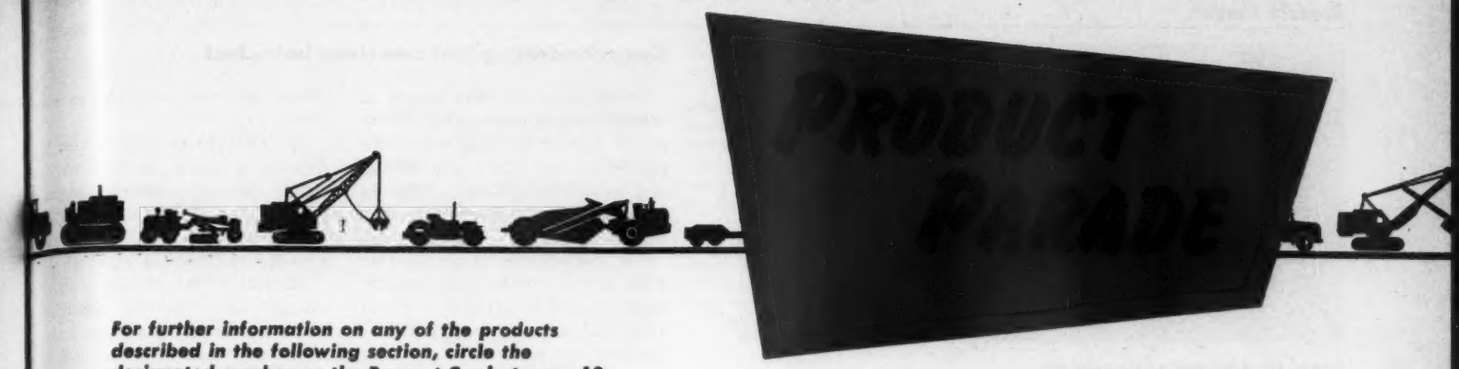
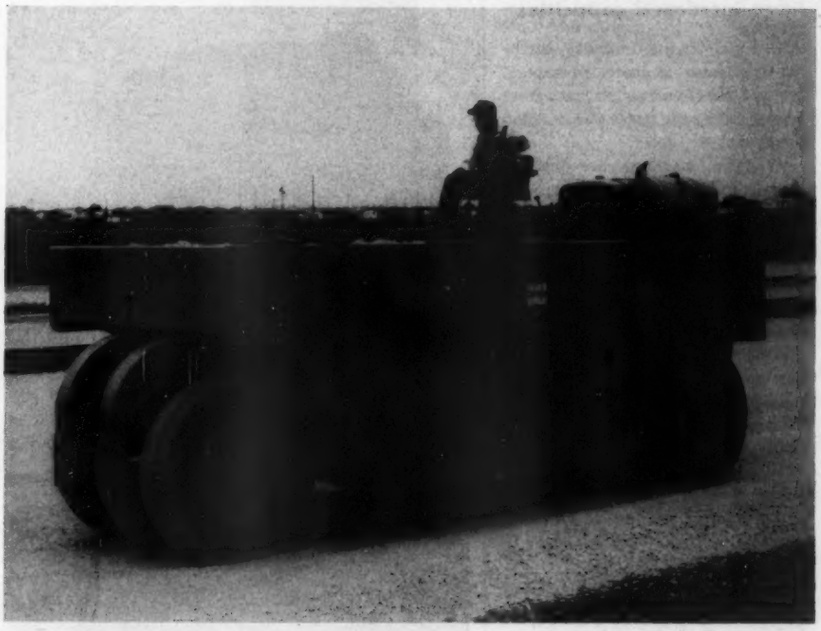
For more facts, use Request Card at page 18 and circle No. 327



For further information on any of the products described in the following section, circle the designated number on the Request Card at page 18.

Self-propelled roller features variable weight up to 33 tons

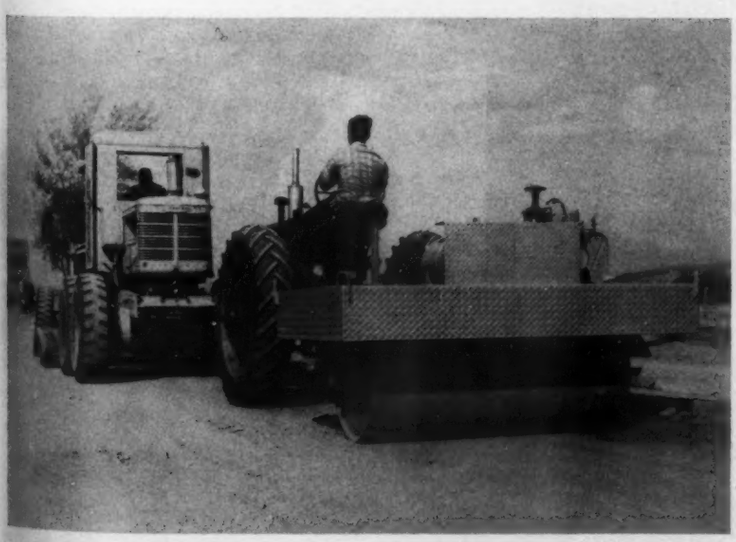


A new 33-ton, self-propelled, 7-wheel roller is announced by the Browning Mfg. Co.

According to the manufacturer, the machine's capacity duplicates heavy truck traffic while construction is still underway, detecting weak spots in base courses. With a variable weight of 11 to 33 tons, this roller can also be used in seal-coating and in bituminous concrete work. Water tanks with a capacity of 520 gallons are standard.

All wheels oscillate independently, assuring complete uniform coverage. The unit is equipped with a large diesel power unit, as well as a torque converter and reversing transmission, and operates at the same speeds both in forward and reverse.

For further information write to the Browning Mfg. Co., Dept. C&E, P. O. Box 2707, San Antonio, Texas, or use the Request Card at page 18. Circle No. 107.



New 12-ton vibratory compactor directs impact vertically only

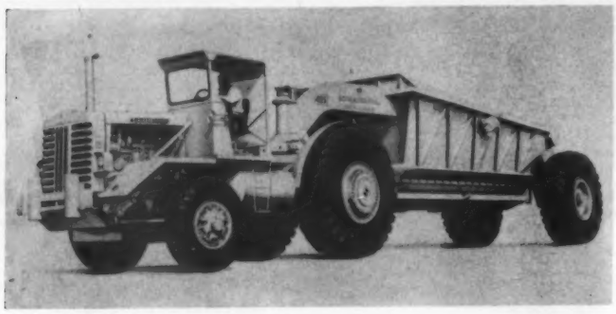
A new pull-type vibratory soil compactor that can direct 12 tons of dynamic impact vertically only (for deeper compaction) is available from the Seaman-Gunnison Corp.

The compactor is designed primarily for working with soil materials as base for roads, airstrips, dams, and buildings. A Hercules 2-cylinder, 35-hp, air-cooled gasoline engine is standard.

Two models are available: the VE-72 with an effective impact area 6 feet wide, and the VE-84 with a 7-foot impact area.

Weighing only 5,000 pounds (6,000 pounds for the VE-84), the impactor is easily pulled over any type of soil or fill by a light rubber-tire tractor.

For further information write to the Seaman-Gunnison Corp., Dept. C&E, 2763 S. 27th St., Milwaukee 15, Wis., or use the Request Card at page 18. Circle No. 106.



One of the three new earthmovers announced by International Harvester, the Paywagon Model 495 has a heaped capacity of 40.5 cubic yards. Over-all length is 50 feet 4½ inches.

Three new earthmovers have increased capacities

Three new International earthmovers, featuring increased capacities and power and higher speeds, are announced by the firm's Construction Equipment Division.

The new machines are the 27-cubic-yard Model 495 Paywagon, the 24-cubic-yard Model 495 Payscraper, and the 24-cubic-yard Model 295 Payscraper.

The Model 495 Paywagon has a heaped capacity of 40.5 cubic yards and a length of 50 feet 4½ inches.

The Model 495 Payscraper has a heaped capacity of 31 cubic yards and an over-all length of 50 feet 6¼ inches. It has a 131-inch cutting width.

The 375-hp 2-axle prime mover offers speeds up to 29.1 mph. Full 180-degree nonstop turns can be made within 39 feet 11¾ inches on a 10-foot 8¼-inch wheelbase, according to the manufacturer.

The Model 295 Payscraper has a heaped capacity of 31 cubic yards and over-all length of 44 feet 8 inches. It is capable of haul speeds up to 26.2 mph. Power steering permits full 90-degree turns. A 4-speed torque converter power-shift package, remote-mounted behind the engine, permits quick, easy shifting.

Powering all three units is the new turbocharged International DT-817 diesel engine, developing 375 horsepower at 2,100 rpm.

For further information write to the International Harvester Co., Dept. C&E, 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 64.

Side-mounted boom for material-handling hoist

The Buck Equipment Corp. announces a 1,000-pound-capacity side-mount Chicago boom for use with the firm's HoisTower.

The boom is mounted prior to or during operations of the HoisTower, and it reportedly may be attached or detached in less than 30 seconds. It is designed to swing 180 degrees for use on either side of the tower.

For further information write to the Buck Equipment Corp., Dept. C&E, 720-X Anderson Ferry Road, Cincinnati 38, Ohio, or use the Request Card at page 18. Circle No. 45.

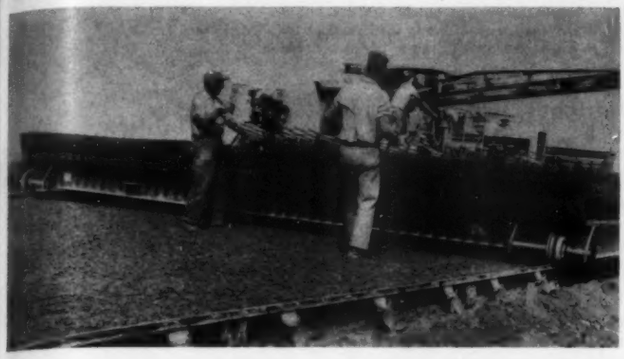
Concrete-drilling tool cuts clean holes fast

One-inch-per-minute speeds in drilling holes in concrete—regardless of the size of the hole—reportedly can be attained with a new drilling tool, called Roto-Imp, which combines rotary action with rapid jackhammer blows.

The tool operates at the rate of 4,000 to 7,000 impulses per minute while the drill bit revolves at 650 to 1,200 rpm. According to the manufacturer, the drill can cut through reinforcing bars and high-carbon twisted wire mesh embedded in concrete.

The tool can drill holes from ½ inch to 4 inches in diameter, is readily portable, weighs 30 pounds, and operates on 115-volt household current or from a small portable 1.5-kw gasoline generator, ac or dc.

For further information write to the Bill Jack Scientific Instrument Co., Dept. C&E, Solana Beach, Calif., or use the Request Card at page 18. Circle No. 96.



Designed to eliminate extra handling of reinforcing mesh, thus saving the labor of from 3 to 5 men, Cleveland Formgrader's new heavy-duty mesh bridge is normally attached to either spreader or strikeoff. It can be loaded with up to 10 tons of reinforcing mesh and dowels. As the paving train moves forward, two men unload and lay mesh from the bridge and place the necessary dowels. The bridge will accommodate variable road widths from 16 to 30 feet and has a 12-foot-wide deck. It has four heavy flanged wheels movable on heavy-duty axles for road-width adjustment and is available with or without tow bars. For further information write to the **Cleveland Formgrader Co.,** Dept. C&E, 34250 Mills Road, Avon, Ohio, or use the Request Card at page 18. Circle No. 44.

HOW Standard Oil serves S.J. Groves on Bong Air Force Base job.

P. S. Cauchy, master mechanic (center) and Standard men Jim Sreenan and Fred Schmalfeldt (left and right) settle details on fuel deliveries.

Contractor moves up to 130,000 cubic yards of dirt in day... Standard Oil provides 'round the clock delivery of fuels and lubricants.

Situation: S. J. Groves is building 11,500 ft. runway and taxi strips at Bong Air Force Base, Kansasville, Wisconsin. Men under A. J. McKay, Groves' project manager, are moving 14 million yards of dirt, putting down a million tons of gravel base and pouring 222,000 cubic yards of concrete.

What was done: When Standard Oil received the order from Groves, two lubrication specialists—Jim Sreenan and Mike Harpham—from Standard Oil's Milwaukee offices went into action. They surveyed the fuel and lubrication needs of the 140 pieces of equipment on the job. They specified the Standard Oil products that would (1) do the job without requiring multiple inventories, (2) reduce the chances of misapplication. Then these men arranged for storage of fuel and lubricants on the site and set up a delivery program with the Standard Oil agent located at Silver Lake, just six miles from the construction job.

Standard Oil agent, Fred Schmalfeldt, and his crews make deliveries to the job between 5:30 and 7:00 each morning and night. In addition, Groves' Euclid dirt loader is serviced by them at noon and midnight. Plus this, a standby truck is stationed at the base throughout the night.

What you can do: This is Standard Oil service to contractors. To get this kind of service on your job, all you have to do is call your nearby Standard Oil office anywhere in the 15 Midwest and Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 So. Michigan Ave., Chicago 80, Ill.**

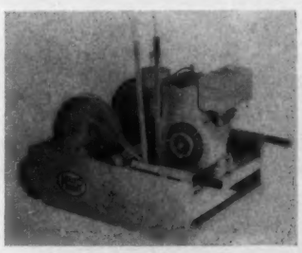
You expect more from STANDARD and you get it!

T. O. (Red) Sargent, Groves' job superintendent, and Jim Sreenan, Standard Oil lubrication specialist, square things away. Jim has the experience for such work as this. He has an engineering degree from the University of Wisconsin. He was an instructor at Standard's Sales Engineering School after graduating from it. He also has years' field experience.

Improvements announced for heavy-duty hoists

Improvements on its heavy-duty builders' hoists are announced by the Muller Machinery Co., Inc.

The redesigned hoists are rated at 750 and 1,000 pounds capacity at 200 fpm, and are equipped with Briggs & Stratton engines developing 5 and 8 horsepower, respectively, at 3,200 rpm. The drums are 4½ inches in diameter and 15 inches long with 16-



inch flanges. The complete units measure 30 inches wide, 41 inches long, and 39 inches high. Each hoist uses 400 feet of ¾-inch manila rope, 1,500 feet of 5/16-inch wire rope, or 2,700 feet of ¼-inch wire rope.

The welded steel main frames have been newly designed, assuring greater strength and rigidity, yet the entire units are said to be lightweight, compact, and perfectly balanced for mobility, easy handling, and ability to operate in limited areas.

For further information write to the Muller Machinery Co., Inc., Dept. C&E, P. O. Box 248, Metuchen, N. J., or use the Request Card at page 18. Circle No. 6.

Offer low-speed winch for pipeline work

Specially designed for pipeline work, the Hyster D7D Lo-Speed winch provides the high pulling power and low line speed required for handling extremely heavy loads. The winch is designed as a matching piece for the Caterpillar D7 tractor.

According to the manufacturer, gear ratios used provide the maximum pulling power consistent with tractor engine power and machine weight. Maximum line speed when mounted on a D7, Series D, 140 horsepower (at flywheel) is 85,000 pounds.

For further information write to the Hyster Co., Dept. C&E, P. O. Box 4318, Portland, Ore., or use the Request Card at page 18. Circle No. 104.

←For more facts, circle No. 328

The new Lorain Power-Set outriggers are shown extended to working position. It is said to take only 76 seconds to go from travel to ready-to work position.

Outriggers for cranes operate hydraulically

A new type of hydraulic-power outriggers, said to take only 76 seconds to adjust from travel to ready-to-work position, is available on Lorain Moto-Cranes, The Thew Shovel Co. announces.

For on-the-job move-up of equipment, it takes just 40 seconds to retract and set the outriggers, the manufacturer reports.

The quick adjustment of the Lorain Power-Set outriggers is made possible by a design featuring four curved outrigger beams. These are arranged in two sets of two side-by-side beams in the outrigger boxes. Each beam is actuated in two directions by a double-acting hydraulic cylinder. The oscillating float at the end of each beam is moved both out and down simultaneously, at a 2:1 ratio, thus combining the two required motions.

Each beam is moved independently from controls in the crane carrier cab or, when available alternate equipment is used, from the turntable cab. The hydraulic power of the carrier steering mechanism suppiles the power to work the outriggers.

For highway travel, the outriggers can be fully retracted, and the floats automatically fold back flush against the ends of the boxes.

For further information write to The Thew Shovel Co., Dept. C&E, 28th and Fulton Road, Lorain, Ohio, or use the Request Card at page 18. Circle No. 12.

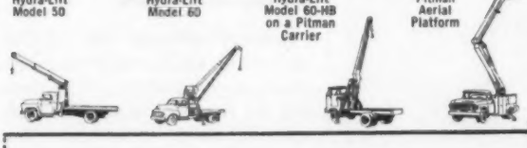
HYDRA-LIFT*

mount one on your truck . . . and load, haul, lay and string pipe with a single unit

With a Pitman Hydra-Lift on your truck, you can load pipe in the yard, haul it to the job at normal truck speed, unload it on the job, then lay it . . . all with a single economical unit. Hydraulic power swings Hydra-Lift's boom 180°, telescopes it from 17' to 27' . . . all you do to operate the boom is move a simple, hand lever. Here is the absolute maximum in time, labor and equipment-saving efficiency. Why not get all the facts today . . . all you have to do is fill and mail the coupon below.

***Model 60-HB shown. Pitman also manufactures . . .**

Hydra-Lift Model 50 | Hydra-Lift Model 60 | Hydra-Lift Model 60-HB on a Pitman Carrier | Pitman Aerial Platform



Only Hydra-Lift Does So Many Jobs, So Well—Handling pipe or pole, placing steel or concrete . . . on these and dozens of other jobs you'll find Hydra-Lift is unrivalled when your loads fall within Hydra-Lift's capacity range.

Please send me full details on_____

I am also interested in a demonstration: Yes____ No____

Name_____

Company_____

Street_____

City_____ State_____

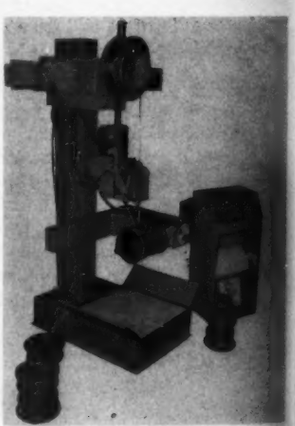
PITMAN MANUFACTURING COMPANY, Grandview, Missouri

For more facts, use coupon or Request Card at page 18 and circle No. 329

Automatic welding unit resurfaces track rollers

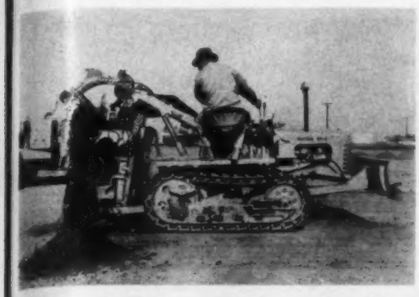
An automatic, self-contained welding unit, designed especially for resurfacing rollers and idlers, is announced by Automatic Welding Co.

Called the Micro-Matic, it automatically adds a rebuilt surface said to require no machining and to provide several times longer wear. The yoke will handle parts up to 48 inches in diameter, and it can be tilted 135 degrees to handle flange re-building as well as concave, convex, or flat circumferential resurfacing to precision tolerances.



The automatic welding head, powered by a variable-speed indexing motor, provides accurate adjustment for depth and width of resurfacing metal. Rheostat control eliminates gear shifting, and automatic step-over offers a wide range of selection.

For further information write to the Automatic Welding Co., Dept. C&E, Airport Road, Waukesha, Wis. or use the Request Card at page 18. Circle No. 94.



Designed to combine the smooth operation of a wheel-type trencher with the vertical advantages of the ladder type, this Challenge unit is for use with two models of Oliver utility tractors.

New trencher announced for utility tractors

A new, improved rotary-bucket-type trencher, designed specifically for use with Oliver's OC-4-3G or OC-4-3D utility tractors, is offered by the Challenge Mfg. Co.

Among the unit's features are:

1. Three digging speeds on bucket line drive.
2. Reverse on bucket line drive.
3. Two optional digging depths, 4 feet 3 inches or 5 feet 7 inches.
4. Three optional bucket widths ranging from 12, 14, 16 inches; 14, 16, 18 inches; or 20, 22, 24 inches with bolt on side clearance teeth.
5. Much heavier chain, sprockets, and bearings to take increased tractor horsepower.

The new tractor-trencher combination, according to the manufacturer, combines the smooth operation of a wheel-type trencher with the vertical advantages of the ladder type.

For further information write to the Challenge Mfg. Co., Dept. C&E, 7400 E. Bandini Blvd., Los Angeles 22, Calif., or use the Request Card at page 18. Circle No. 70.

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card that is bound in at page 18 of this issue.

New asphalt batch plants have big-model features

The Barber-Greene Co. announces two new asphalt batch plants — the Model 890, with a 1,000-pound rated capacity, and the Model 891, with a rated capacity of 1,500 pounds. Both new plants are basic 4-bin units designed for the production of all types of bituminous mixes.

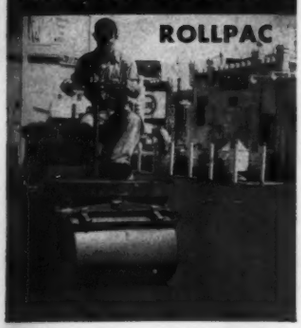
Among the features stressed by the manufacturer is the Batchometer asphalt-measuring system said to combine accuracy with push-button operation. Also, both models incorporate the firm's Dyna-Mix pugmill, which allows the entire batch to rest below the center line of the paddle shafts.

The plants are of 3-unit design: screen and bin section, weigh hopper and pugmill section, and base section. Each section is equipped with special tapered pin and socket connections which, during erection, guide it into place and automatically align all bolt holes. Both models are equipped with a 3 1/3-deck vibrating screen designed to handle a full range of asphalt mixes at top capacities.

According to the manufacturer, extensive use of hydraulics is made in the plant controls.

For further information write to the Barber-Greene Co., Dept. C&E, 400 N. Highland Ave., Aurora, Ill., or use card at page 18. Circle No. 2.

YOU CAN'T OUTGROW A ROLCOR ROLLER
STATIC OR VIBRATORY



Whether your job is . . .
Crusse rolling . . . Driveways . . . Parking lot . . . Patching . . . Tennis courts . . . Sod rolling . . . Maintenance . . . you won't outgrow the usefulness of a Rollpac.
That's why thousands of contractors, landscapers, institutions and others make Rollpac their "number one" unit. One week on *your* job will prove to you why Rollpac is the top selling one-ton roller in the United States.

Here's a two-ton vibratory roller that produces compaction to equal or exceed static rollers weighing eight tons! Vibrapac is 100% American designed and built specifically for asphalt and soil compaction—no corrugation of surfaces. A single lever clutch shifts from static to vibratory action. Works in close places.

Easy to transport with Rolcor Trailer.

WRITE FOR FULL INFORMATION AND LITERATURE

ROSCO MANUFACTURING CO.
ROLCOR DIVISION
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For more facts, circle No. 330

with the Falcon Chief and save money, too!

speak as you normally would—be clearly heard and understood up to ½-mile away!

Unique transistorized power megaphone—an instrument you will be proud to own. Gives up to 6,000 two-second amplified messages from standard replaceable battery. Light (3¼ lbs.)—easy to handle and use. Attractive red and gray polyethylene—built for abuse. Attractively priced for you, too!

WRITE for particulars — and free, informative "Sounds for Safety" folder! Dept. CE

Falcon® ALARM CO., INC.
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OWEN

the Greatest Name in Buckets All Over the World

Wherever you go, wherever you see excavating or handling of materials . . . there you will find one or more OWEN Clamshell Buckets on the job. Faith in their performance, confidence in their sturdy construction, and complete assurance in their ability to complete contracts satisfactorily and "on time" . . . these are the reasons that powerful, rugged OWEN Clamshell Buckets dot construction jobs all over the globe.

You'll get more from an OWEN in every way — Longer Life, Larger Loads, More Economical Operation. From drawing board to finished product, OWEN lives up to its great name in every way. Put the real worker on the end of the boom! — get a Great OWEN Clamshell Bucket without delay.

OWEN MATERIAL HANDLING BUCKETS

OWEN'S new center line reeving principle, now incorporated in a completely redesigned line of material handling buckets, is one factor that increases cable life of these buckets up to 75%. A full line now available from ¼ cu. yd. up to 10 cubic yards.

OWEN GRAPPLES

OWEN'S patented independent tine action 4-prong grapple has proven itself invaluable in land clearing operations. Its independent tine action guarantees positive contact and tremendous gripping power on each of the four tines, no matter how irregular the shape of the object may be.

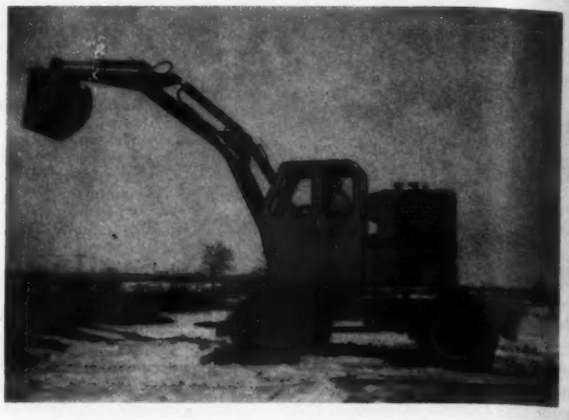
Write us your exact requirements. Remember, OWEN Engineers are at your service. Send for Free Catalog today.

The OWEN BUCKET Co.
BREAKWATER AVENUE, CLEVELAND 2, OHIO
BRANCHES: New York • Philadelphia • Chicago
Berkeley, Calif. • Fort Lauderdale, Fla.

100

For more facts, use Request Card at page 18 and circle No. 332

On the Davis Model AH-4, travel, steering, wheel brakes, and attachments are hydraulically controlled from the single operator station.



New excavator-crane is fully hydraulic

The Model AH-4 Hydra X Cavator-crane is announced by Davis Engineering, Inc.

The self-propelled, one-man-operated machine features full hydraulic control. Available end attachments, which are quickly interchangeable on the same basic boom and dipper stick, include backhoe, shovel, clamshell and shovel-loader buckets, and backfill blade.

Buckets come in ⅜-cubic-yard capacities. The backhoe digging depth is 11 feet; with extended dipper stick this can be increased to 13 feet.

As a crane, the machine can lift up to 4 tons without outriggers. A telescoping crane boom or gooseneck boom is available with lifting heights up to 25 feet.

The Model AH-4 travels at speeds up to 4½ mph.

For further information write to Davis Engineering, Inc., Dept. C&E, P. O. Box 127, Dowagiac, Mich., or use the card at page 18. Circle No. 32.

MORE POWER—BROADER LINE—CONTINENTAL IN '59

GOOD RULE TO FOLLOW WHEN BUYING

MATERIALS HANDLING EQUIPMENT

Choose a Make Whose Builder Thinks Enough Of His Own Good Name to Equip His Product With

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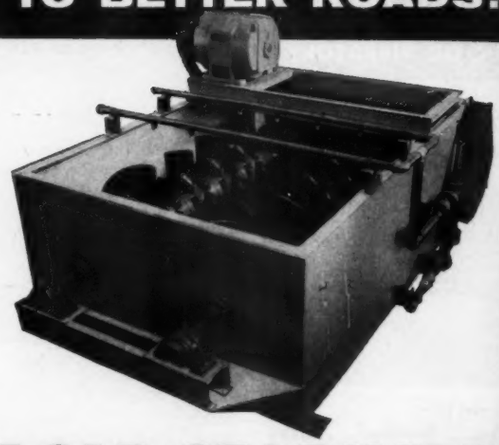
We're Proud of Michigan

For more facts, use Request Card at page 18 and circle No. 333

HERE'S A SHORT CUT TO BETTER ROADS!

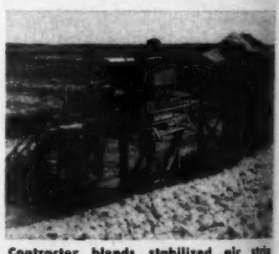


EAGLE STABILIZED ROAD BASE MIXER

A BETTER QUALITY of stabilized road base material can be produced at the quarry or pit, or roadside stockpile, with an EAGLE MIXER. Far more thorough mixing is provided than by mixing materials in-place on the right of way.

The EAGLE MIXER consists of a tub mounting two opposing rows of paddles which thoroughly mix and blend materials, while conveying them toward discharge opening. Mixer can be erected over bin or hopper with clamshell gates or elevated for discharging directly into trucks. Can be equipped with spray bars and water metering system, as optional equipment.

The EAGLE MIXER blends water and required additives with fine and/or coarse aggregate, aggregate with clay, crushed stone with crusher dust and other stabilized road base materials for supporting asphaltic or concrete pavement. These rugged units are available in four sizes with capacities of 125 to 500 t.p.h. You can build better roads at lower cost with the EAGLE MIXER—Send for Bulletin 1258 today!



Contractor blends stabilized air strip base materials at Columbus, Miss., air base, with an Eagle Mixer.

Western Contracting Co., Sioux City, Ia., mixes sand, clay and water producing an amalgam to form the base for concrete slabs and blacktop shoulders on a highway from Omaha to Lincoln, Neb.

SINCE 1872

EIW EAGLE IRON WORKS

EAGLE IRON WORKS

ENGINEERS • MANUFACTURERS

159 Holcomb Ave., Des Moines, Iowa

For more facts, use Request Card at page 18 and circle No. 334

Transistorized barricade gives alternating flashes

An alternating-flash transistorized barricade, featuring a wigwag effect and giving from 100 to 120 flashes per minute, is announced by the Electronic Specialties Co.

Called Alter-Flash, the barricade is made of heavy-gage steel, has a 42×12-inch apron, and is available with 7 or 4-inch flasher heads.

Power is supplied by a 6-volt battery.

For further information write to the Electronic Specialties Co., Dept. C&E, Batavia, Ill., or use the Request Card at page 18. Circle No. 21.

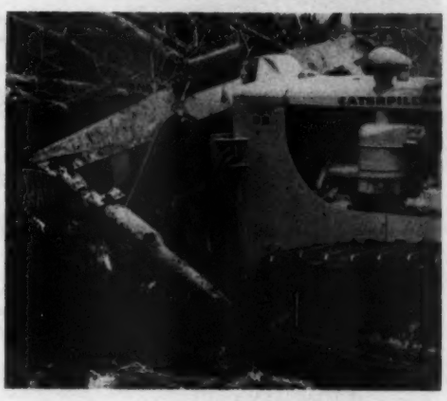
Complete accessory line for air compressors

More than 60 different items are offered by The Campbell-Hausfeld Co. in its line of accessories for air compressors and paint-spraying equipment.

Included in the line are air caps, cup assemblies, material containers, air-pressure gages and regulators, air-line filters, valves, couplings, hose assemblies, respirators, etc.

For further information write to The Campbell-Hausfeld Co., Dept. C&E, 801 Moore St., Harrison, Ohio, or use the Request Card at page 18. Circle No. 98.

Hydraulic tilt cylinders for bulldozers, designed to do a fast, effective job on work such as pioneering land clearing, removing stumps, dozing on slopes, digging rocks, or ditching, are available from the Caterpillar Tractor Co. When mounted on a dozer, the cylinder makes it possible to put maximum prying action on the corner of the blade from an in-the-seat position. The hydraulic tilt cylinder replaces the left dozer brace only. Since the cylinder rod is extended halfway at level position, it can tilt in either direction. Cylinders are available for the Nos. 7S, 8S, 9S, and 9U bulldozers. For further information write to the **Caterpillar Tractor Co.,** Dept. C&E, Peoria, Ill., or use the Request Card at page 18. Circle No. 80.



Geared by FULLER . . .

. . . M-R-S 38 Cubic Yard Scraper Combination equipped with R-1550 ROADRANGER®

M-R-S Manufacturing Company, Flora, Mississippi, recently announced a new 38 cubic yard, struck—48 yard, heaped—capacity scraper combination.

The 600 hp M-R-S Model 250 Tractor provides ample power to pull the big scraper at speeds up to 34 miles per hour, with a substantial power reserve for maximum gradability. When necessary, traction to the drive wheels can be increased by use of the M-R-S hydraulic weight transfer feature.

To make most efficient use of the power and traction of the Model 250, M-R-S offers as standard equipment the Fuller R-1550 9-speed ROADRANGER® Transmission.

Designed for off-highway service with the largest high-speed diesel engines built, the semi-automatic R-1550 ROADRANGER features nine forward and two reverse ratios, all controlled with one gear shift lever. Short, even steps between gear ratios—averaging 38%—combined with pre-selected, automatic range shifts, permit proper gearing for all conditions at all times. Air powered countershaft inertia brake allows quick upshifts without double clutching. For faster work cycles, lower fuel consumption, longer engine life, less operator fatigue, GREATER PROFITS . . . specify Fuller. Your equipment dealer or manufacturer can recommend the most efficient, easiest-shifting Fuller Transmission for your specific operating requirements.

FULLER TRANSMISSION DIVISION MANUFACTURING COMPANY KALAMAZOO, MICHIGAN
Subsidiary EATON Manufacturing Company

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.
Automotive Products Company, Ltd., Brock House, Langham Street, London W.1, England, European Representative

For more facts, use Request Card at page 18 and circle No. 336

IF IT'S A **WET JOB**
let Griffin analyze your ground water problem and estimate costs

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Jacksonville, Fla. • Houston, Tex.
W. Palm Bch., Fla. • Hammond, Ind.

For more facts, circle No. 335

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✓ quickly
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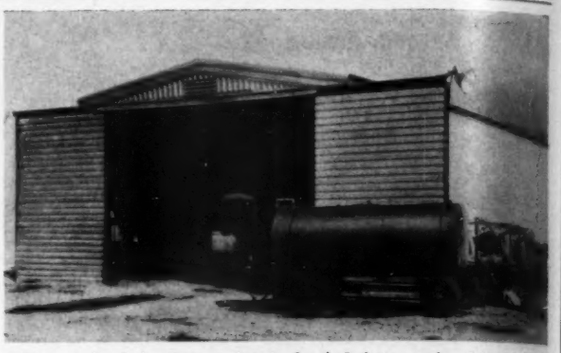
and with just
ONE MAN

Unload sand, stone and other aggregates just as fast as your conveyors can work. No bottleneck at unloading point.

Write today!

NATIONAL CONVEYOR & SUPPLY CO. 359 N. Harding Ave. Chicago 24, Illinois

For more facts, use Request Card at page 18 and circle No. 337



A firm on the Oahe Dam project in South Dakota used a 24×112-foot Stran-Master building for a run-through scraper maintenance shop.

Maintenance building is all steel, portable

An all-steel portable maintenance building, designed for do-it-yourself construction by an unskilled crew, is announced by the Stran-Steel Corp.

The Stran-Master comes in a wide range of widths from 12 to 120 feet. No cranes or heavy equipment are needed for erection. There are no nails or spikes to be driven; all framing connections are made through factory-drilled holes for bolting.

For further information write to the Stran-Steel Corp., Division of National Steel Corp., Dept. C&E, Tecumseh Road at Fink, Detroit 28, Mich., or use the Request Card at page 18. Circle No. 130.

Bridge column forms in variety of sizes

Designed primarily for use in bridge and overpass construction, the new Efco bridge column forms are said to be ideal for all types of heavy construction where sturdy columns are needed. They are also adaptable to

other uses, such as the forming of pier nosings. For this purpose, they are combined with regular Efco forms, the latter being used to form the sides of the pier.

The bridge column forms are available in a variety of sizes. For columns up to 4 feet in diameter, the forms are furnished in 180-degree sections 4 feet high. Larger diameters are fabricated in 90-degree sections or less.

Efco plate clamps are utilized on both horizontal and vertical joints.

For further information write to the Economy Forms Corp., Dept. C&E, Box 128-E, Highland Park Station, Des Moines, Iowa, or use the Request Card at page 18. Circle No. 101.

THE GALION T-700 GRADE-O-MATIC GIVES YOU — *MORE WORK CAPACITY*

- **EFFICIENT UTILIZATION OF POWER** . . . . . Torque converter drive.
- **EFFECTIVE BALANCE OF WEIGHT AND HORSEPOWER** (42,000 lbs.—220 hp.) . . . . . No "spinning" of drive wheels, No "lifting" of front wheels, No stalling—No lugging.
- **LARGE MOLDBOARD** . . . . . 14' x 30" x 1" hydraulic shiftable moldboard.
- **FAST WORK CYCLES** (20 mph forward or reverse) . . Utmost "push-power" at the blade.
- **EASY OPERATION** . . . . . Hydraulic controls, power-shift transmission, tail-shaft governor, decelerator, hydraulic shiftable moldboard, no clutch.

Write for Bulletin No. 409

THE GALION IRON WORKS & MFG. CO.
General and Export Offices—Galion, Ohio, U.S.A.

GALION ESTABLISHED 1907 **MOTOR GRADERS & ROLLERS**

For more facts, use Request Card at page 18 and circle No. 338

New steel-cable tire offers greater mileage

The B. F. Goodrich Tire Co. has begun production of a steel-cable truck tire that is said to give up to 20 per cent more mileage than conventional truck tires. Called the Power Express Steel Cable, it uses steel cords to reinforce the rubber carcass instead of the textile cords used in conventional tires.

The 2-ply steel-cable tire will reduce the incidence of flats from punctures by as much as 90 per cent, and will practically eliminate bruise breaks in the tire carcass, according to the manufacturer.

Current production is limited to heavy-duty tube-type truck tires in sizes 9.00-20, 10.00-20, and 10.00-22. Sizes 8.25-20, 11.00-20, and 11.00-22 will go into production soon.

For further information write to the B. F. Goodrich Tire Co., Dept. C&E, 500 S. Main St., Akron 18, Ohio, or use the Request Card at page 18. Circle No. 102.

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card that is bound in at page 18 of this issue.

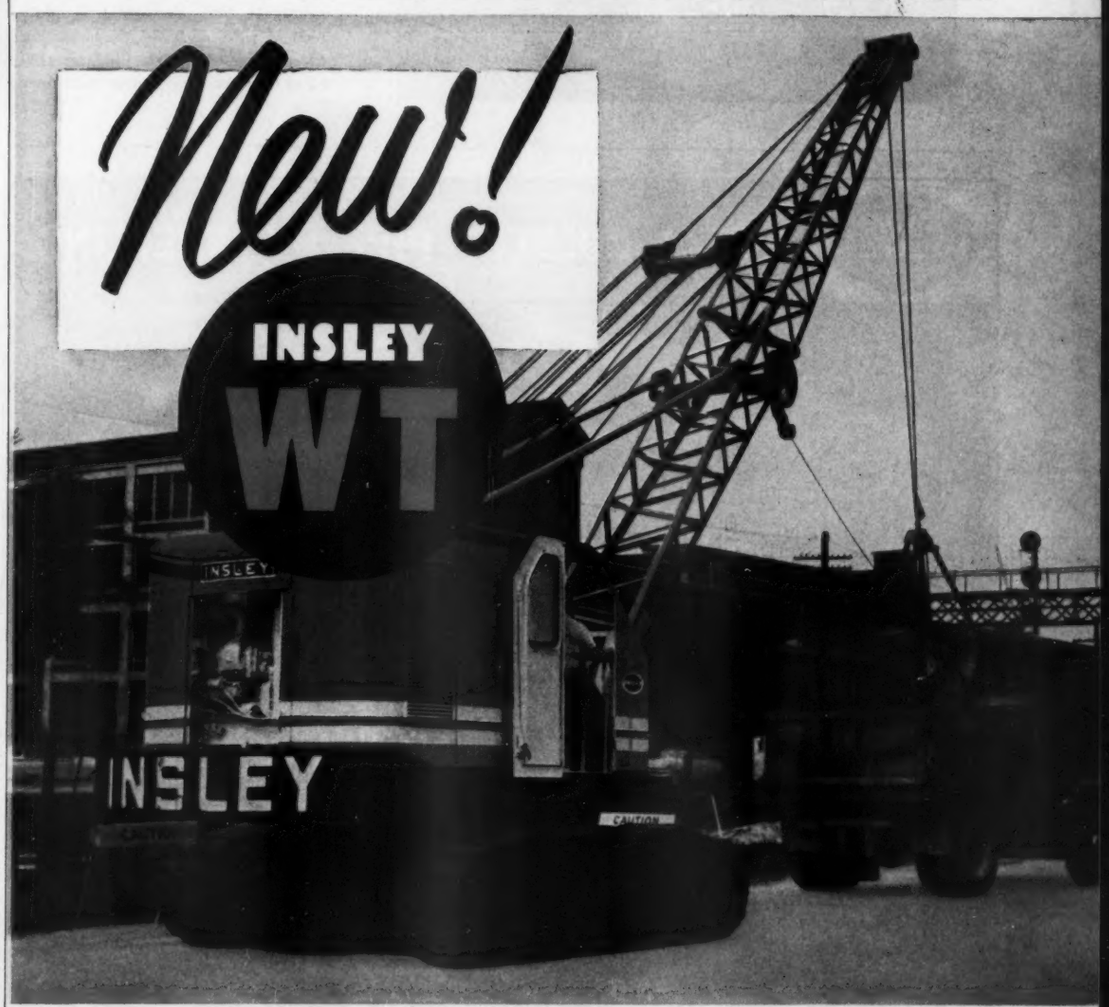
Improved trencher offers several new features

The Charles Machine Works announces the Model C-3 Ditch Witch trencher.

New features of the machine include a positive-acting spring-loaded clutch, which improves ease of handling by the operator. A new ball-bearing screw jack reportedly triples the speed of raising and lowering the digging chain, and reduces operator effort required for this operation. A spring-loaded sprocket on the digging boom maintains correct digging-chain tension at all times and allows rocks, gravel, nails, and other foreign material to pass through the digging chain without stalling the machine.

Standard equipment for the C-3 includes a 2-foot-depth digging chain with a selection of teeth for digging 3, 4, and 6-inch-wide trenches.

For further information write to The Charles Machine Works, Inc., Dept. C&E, 625–30 Birch St., Perry, Okla., or use the Request Card at page 18. Circle No. 84.



Owner: J. J. Struzziery Co., Dedham, Mas

1 cu. yd. excavator • 30-ton truck crane
25-ton crawler crane • 30-ton Maxi crane

Besides being as rugged as they come for unmatched "day in and day out" dependability, the new Insley WT is "power matched" to capacity for a profitable combination of performance, efficiency and long life. Here, for example, are a few of the many "plus values" that make the new Insley a top performer.

- **Dependable, easily operated mechanical clutches.**
- **Precision boom raising and lowering through planetary gears.**
- **Power load lowering . . . full load control with maximum safety.**
- **Accessible lubrication and adjustment points encourage good maintenance for peak operating efficiency and long life.**
- **Designed with the operator in mind . . . wide vision cab with operator safety and comfort features.**
- **Unmatched parts and service program . . . 97 per cent of all parts orders shipped the same day received . . . parts available on a 24-hour basis.**

See your Insley dealer now. Get all the facts on the new, top-performing Insley WT. See for yourself how it can bring in new, big profits in your type of work.

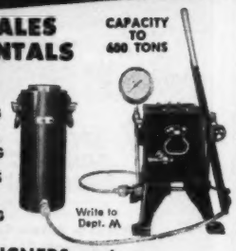
THERE'S AN INSLEY WORKING NEAR YOU

INSLEY MANUFACTURING CORPORATION
GENERAL OFFICES—INDIANAPOLIS 6, IND.
WEST COAST DIVISION—LOS ANGELES 54, CALIF.

For more facts, use Request Card at page 18 and circle No. 340

DUDGEON HYDRAULIC JACKS

SALES RENTALS
CAPACITY TO 600 TONS
FOR:
PILE TESTING
UNDER-PINNING
BRIDGES
PIPE PUSHING



DESIGNERS and MANUFACTURERS OF
Hydraulic Units For Special Applications

RICHARD DUDGEON INC. EST. 1850
789 BERGEN STREET BROOKLYN, N. Y.
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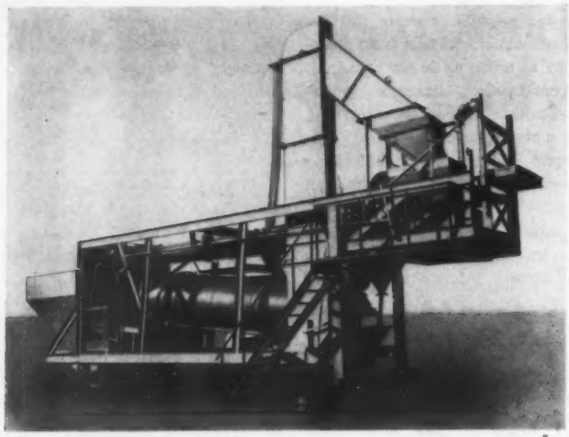
For more facts, circle No. 339



A feature of the Cutler plant is an easily calibrated heated asphalt bucket and measuring system; the capacity rating of the pugmill is based on the area below the center line of the shafts.

Portable asphalt plant has capacity of 40 tph

A new 40-tph, portable, batch-type asphalt plant, completely contained in one unit for quick and easy travel, is announced by the Cutler Engineering Co.

Features include truck-high loading of the finished mix, easy-to-load cold aggregate bins, reciprocating plate feeders with accurate proportioning gates, large-size dryer, and an efficient dust-collector system with fines return. In addition, the plant offers a dial scale controlled weigh hopper for accuracy, as well as an easily calibrated heated asphalt bucket and measuring system, with a double-shafted 24-paddle jacketed 1,500-pound pugmill with a capacity rating based on the area below the center line of the shafts.

The unit is available with or without a gradation (screen and hot bin) section.

For further information write to the Cutler Engineering Co., Dept. C&E, 5435 W. 63rd St., Chicago 38, Ill., or use the Request Card at page 18. Circle No. 93.

Hydraulic jumbo arm is aid to drilling

A new hydraulic jumbo arm, designed to provide greater flexibility of drilling, more rapid positioning, and more accurate hole spacing, is offered by the Le Roi Division of the Westinghouse Air Brake Co.

Designated Model LJB, the unit is available in three lengths, with 4-foot telescopic extensions offered on two of the three.

Designed for use in quarrying and construction tunneling or trenching, the arm can be mounted on drill jumbos, crawler tractors, or truck platforms. Controls can be mounted on either side of the arm or on the pedestal.

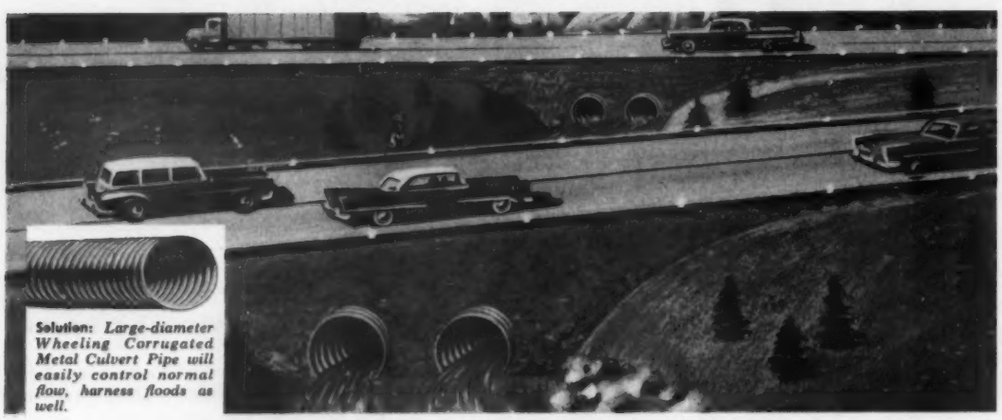
Double-acting hydraulic cylinders quickly extend, retract, swing, and elevate the arm. The air-motor-operated hydraulic pump is governed to

Wheeling

METAL CULVERT PIPE BY WHEELING

Problem: *How to tame the rushing water of this deep, fast-flowing stream. Flash floods from the nearby mountains are a constant threat here.*

Solve stubborn drainage problems...



Solution: *Large-diameter Wheeling Corrugated Metal Culvert Pipe will easily control normal flow, harness floods as well.*

with Wheeling Metal Culvert Pipe!

Small-diameter Wheeling Metal Culvert Pipe is ideal for farm and home drainage requirements.

Wheeling Pipe Arch — a wider type of metal pipe with comparatively flat bottom—is used where headroom is limited.

When you face drainage problems like these, versatile Wheeling Culvert Pipe offers more solutions—at lower cost—than any other type of drainage pipe.

That's because Wheeling metal pipe combines flexibility under heavy traffic loads with durability over years of rugged service. It combines easy installation with economical transportation (the long sections of pipe are nestable, won't crack or spall). In short, when the problem is drainage, the solution is Wheeling Metal Culvert Pipe.

Wheeling Metal Culvert Pipe or Pipe Arch, in Copper-bearing Steel or Copper-bearing Pure Iron, plain galvanized or bituminous coated (with or without paved invert) is available in a wide range of gauges and diameters. Contact your nearest Wheeling warehouse, culvert plant or sales office. Wheeling Corrugating Company, Wheeling, West Virginia.

WHEELING CORRUGATING COMPANY · IT'S WHEELING STEEL!

Immediate delivery on all stocked items from these warehouses: *Boston, Buffalo, Chicago, Columbus, Detroit, Kansas City, Louisville, Madison, Minneapolis, New Orleans, New York, Philadelphia, Richmond, St. Louis.* Sales Offices: *Atlanta, Houston*

For more facts, use Request Card at page 18 and circle No. 841

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SPECIAL DRILLING PROBLEMS

Offices in Atlanta, Ga., Pittsburgh, Pa., Washington, D.C., Cleveland, Ohio

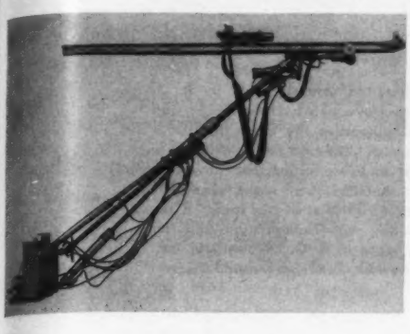
Wire or phone for a quotation on your next foundation job — ANYWHERE IN THE WORLD

McKINNEY DRILLING COMPANY

NACOGDOCHES, TEXAS

Ph.: LOgan 4-8373 • P. O. Box 190

For more facts, circle No. 842



More drilling flexibility, more accurate hole spacing, and faster positioning and drilling are benefits claimed for the LJB hydraulic jumbo arm.

maintain constant pressure at all times. A safety valve in the lift cylinder prevents the arm from falling if the hose or hydraulic system fails.

Horizontal arm swing is 60 degrees to the outside and 45 degrees to the inside. Raise-and-lower radius totals 90 degrees: 60 degrees above and 30 degrees below horizontal.

For further information write to the Le Roi Division, Westinghouse Air Brake Co., Dept. C&E, 1706 S. 68th St., Milwaukee, Wis., or use the Request Card that is bound in at page 18. Circle No. 7.

Extend generator line to include 50 models

Dc generators manufactured by the Kato Engineering Co. are now available in sizes ranging from 500 watts to 40 kw, with various voltages throughout the line. The improved, extended line includes 50 different dc outputs.

Both shunt and compound-wound units are available throughout the range of sizes, enabling the generators to be used for a wide range of applications, including battery charging, testing, and operating dc appliances.

For further information write to the Kato Engineering Co., Dept. C&E, 1415 First Ave., Mankato, Minn., or use the Request Card at page 18. Circle No. 83.

Calcium-chloride batcher weighs to plant mixers

A calcium-chloride weigh batcher, designed to simplify the addition of a standard solution of calcium chloride to concrete mixers at batch plants, is announced by the C. S. Johnson Co.

Capacity of the weigh batcher is ample for a 3½-yard batch with 2 per cent calcium chloride or for a 7½-yard batch with 1 per cent of the solution. These figures apply even when up to 7 sacks of cement per yard are used, according to the manufacturer.

One remote-control box contains all control switches and indicator lights. The batcher can be wired to batch and discharge automatically in combination with other automatic controls.

For further information write to the C. S. Johnson Co., Dept. C&E, P. O. Box 71, Champaign, Ill., or use the card at page 18. Circle No. 36.

DRILL CONCRETE IN SECONDS

Instead of Hours with PENNDRILL

Holes can be drilled thru any type masonry material—concrete, marble, brick and tile; including reinforcing bars or other steel encountered.

Using diamond bits as the cutting agent, holes are drilled faster and at a lower cost than by any other method.

Penndrill equipment drills holes—1" to 24" in diameter, up to 19" deep—vertically, horizontally or at any angle. Long-life diamond bits in stock 3/16" to 14" in diameter.

Millions of holes have been drilled with Penndrill bits, cutting job costs up to 60%.

Write for illustrated literature

PENNSYLVANIA DRILLING CO.
MASONRY DRILL DIVISION
1201 Banksville Road, Pittsburgh 16, Pa.

For more facts, circle No. 343

CYANAMID Explosives News

• Four concentric layers of plastic insulate Cyanamid Blasting Cap Wires for maximum performance!

Vinyl plastic leg-wire insulation, applied by Cyanamid's unique continuous-bath method, offers superior uniformity . . . free of thin spots . . . and improved dimensional stability.

As a result, it combines these important advantages:

- Greater electrical insulation . . . with dielectric strength of 4,000-6,000 volts!
- High abrasion resistance!
- Improved flexibility . . . even at –40°F!
- Insulation values retained during prolonged high-temperature exposure!
- Inert to materials used in dynamite formulations!
- Non-porosity and greater moisture resistance!

Perfect concentricity is achieved by dipping the wire in four consecutive baths. Between baths, it passes through a series of dies which remove excess material and each coat is heat-cured. Imperfections which could occur in a single coating are eliminated in this multi-coat system.

For additional information about our complete line of electric blasting caps, write Cyanamid or consult our Field Engineer.

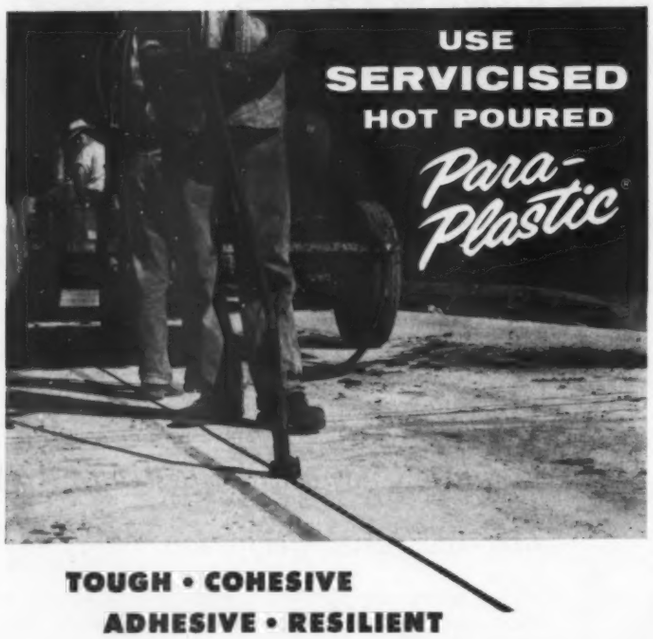
Visit Cyanamid at the AMC Coal Show in Cleveland, May 11-14, Booth 1524.

AMERICAN CYANAMID COMPANY
EXPLOSIVES AND MINING CHEMICALS DEPARTMENT
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

For more facts, use Request Card at page 18 and circle No. 344

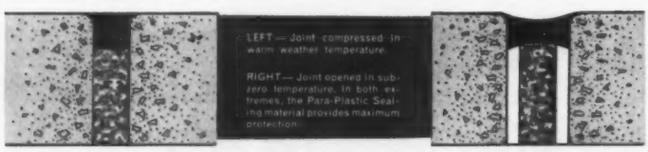
A gigantic earthmover with push-button controls, built by R. G. LeTourneau Inc., has the power to move two buckets to dig and haul a 130-ton load. One operator handles the more than 100-foot-long machine. The buckets can be filled and emptied together or separately. Two 600-hp diesel engines furnish the power to drive dc motors geared directly to the rims of all eight wheels, as well as to drive ac motors located at other strategic spots on the machine. The earthmover is equipped with Timken tapered roller bearings. For further information write to **R. G. LeTourneau, Inc.,** Dept. C&E, 2399 S. MacArthur, Longview, Texas, or use the Request Card at page 18. Circle No. 58.

For EFFECTIVE Highway Joint Sealing



TOUGH • COHESIVE
ADHESIVE • RESILIENT

Para-Plastic is the original hot poured rubberized asphalt joint sealing compound that forms a resilient, adhesive, and effective seal which maintains bond at sub-zero temperatures. Unaffected by extremes of temperature, Para-Plastic insures a moisture-tight seal of expansion, contraction, and dummy joints in concrete pavement of all types.


LEFT—Joint compressed in warm weather temperature.
RIGHT—Joint opened in sub-zero temperature. In both extremes, the Para-Plastic Sealing material provides maximum protection.

Drawings above illustrate the sealing of a typical pavement expansion joint. Para-Plastic can be used equally well to seal contraction joints in highway pavement. Sealed with hot poured Para-Plastic, the joint remains free of water and other foreign material which could cause failure of the concrete.

For complete information on Hot Poured Para-Plastic and other products for highway and engineered construction, write for the Servicised Products Catalog.

SERVICISED PRODUCTS
CORPORATION
6051 WEST 65th STREET • CHICAGO 38 ILLINOIS

For more facts, use Request Card at page 18 and circle No. 345

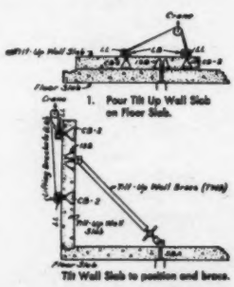
Precast Concrete Components Lifted and Placed With Richmond Lifting Inserts

Precast wall slab being tilted into place by means of Richmond Lifting Inserts and Lifting Brackets.

Certified laboratory tests assure proper strength rating for efficient design and performance in concrete at usable strength

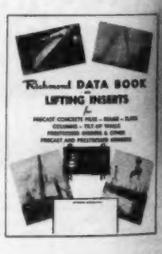
Richmond has developed and tested a complete line of Lifting Inserts and accessories for handling and placing of precast concrete wall slabs, columns, beams, girders, piles, etc.

No matter what type of precast units are involved, Richmond can supply exactly the right type of insert for the specific job.



These units are designed with adequate extra strength and for simple operation in lifting and bracing precast concrete components.

Send for your copy of the Richmond Data Book on Lifting Inserts giving complete technical data, dimensions, working loads and ultimate strengths in various strengths of concrete. At the same time ask for your copy of the latest Richmond Handbook showing the complete line of form tying anchorage and accessory devices for concrete construction backed by 47 years in this field.



INSIST ON RICHMOND
....AND BE SURE
IT'S RICHMOND
Richmond
SCREW ANCHOR CO., INC.
816-838 LIBERTY AVE., BROOKLYN 8, N. Y.
315 SOUTH FOURTH ST., ST. JOSEPH, MO.

RICHMOND SCREW ANCHOR COMPANY, INC.
816-838 Liberty Ave., Brooklyn 8, N. Y.
or 315 South Fourth St., St. Joseph, Mo.

For more facts, use Request Card at page 18 and circle No. 346

Road widener handles all types of mixes

Barber-Greene's newly announced Model SJ-50 road widener is designed to handle all types of road-widening jobs and all types of road-widening mixes including soil, concrete, asphalt, stone, and stabilized materials.

The SJ-50 consists, basically, of two units; a tractor and a trailer. The two are connected by a conventional fifth-wheel arrangement. The tractor includes the operator's deck, the power unit, the drive wheels, the receiving hopper, and the discharge conveyor. The trailer, which is equipped with its own jib hoist, supports the widening attachments during operation; it also serves to transport the tractor unit and the attachments when moving from job to job.

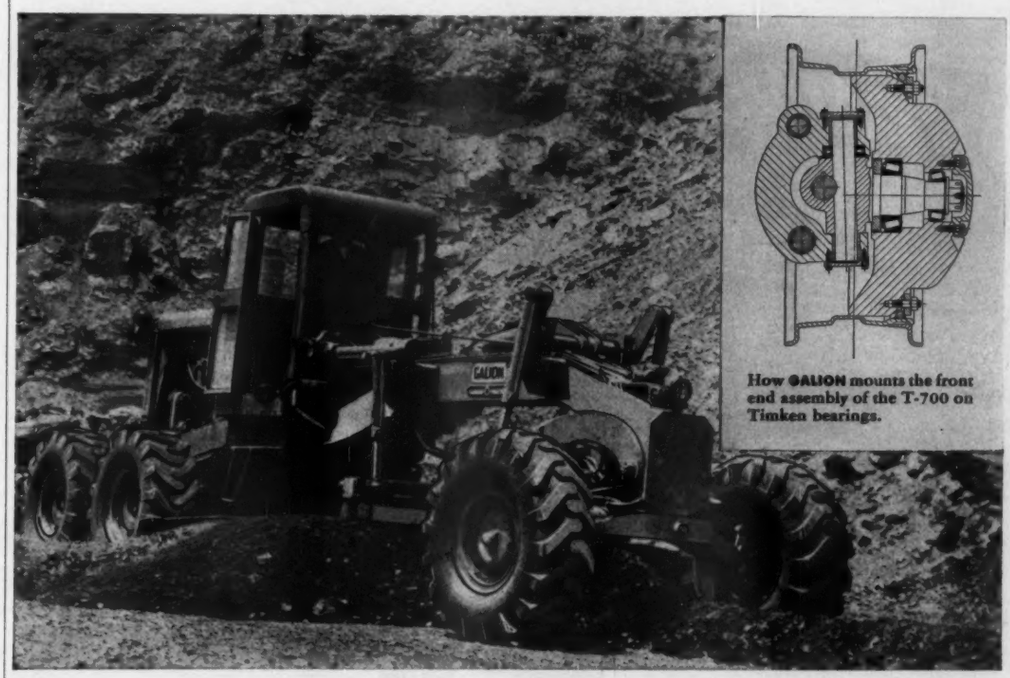
During operation, the tractor becomes, in effect, a power steering axle for the tractor-trailer combination. It is attached to the trailer by the fifth-wheel kingpin and also by hydraulic rams which, through their movement, provide a positive steering force and give the operator fingertip control of steering. Since the weight of the laying attachments is borne by the trailer's jib hoist, complete steering control is assured, even under severe side drag conditions.

For loading or for movement of the tractor unit alone, small supporting wheels are added under the tractor's hopper to provide a 4-wheel base.

The SJ-50 features 10 speeds forward and 2 in reverse, and a 10½-mph travel speed.

For further information write to the Barber-Greene Co., Dept. C&E, 400 N. Highland Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 9.

Complete asphaltic stone, soil, and stabilized-material handling equipment is offered with the SJ-50, for widening from 1 to 10 feet. Widths may be varied hydraulically while laying.



How GALION mounts the front end assembly of the T-700 on Timken bearings.

World's largest motor grader weighs more than 20 tons—24 TIMKEN® bearings take the load

THE world's largest motor grader (above) sets up enormous loads as it slams a road into shape. And when it rolls on a steep grade, the thrust loads are even greater. To make sure their T-700 Grade-O-Matic could take *all* the loads, the Galion Iron Works & Manufacturing Company specified 24 Timken® tapered roller bearings—for the reverse gear case, transfer case, front wheels and king pins, and the rear wheel tandem drive.

The tapered construction of tapered roller bearings lets them take all combinations of loads—thrust as well as radial. And because they're case-carburized to produce hard, wear-resistant surfaces over tough, shock-resistant cores, Timken bearings take the shock loads of heavy construction work. And full line contact between rollers and races gives them extra load carrying capacity to stand up to the job day after day, season after season.

Timken bearings are geometrically designed to provide true rolling motion—precision manufactured to live up to their design. They practically eliminate friction. And by holding shafts concentric with their housings, they make closures more effective—keep lubricant in, dirt out.

And to make sure we control the quality of Timken bearings all the way down the line, we even make our own steel—an extra step no other American bearing manufacturer takes.

Make sure you get all these advantages in the machines you buy or build. Specify Timken bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable: "TIMROSCO".

This symbol on a product means its bearings are the best.

TIMKEN TAPERED ROLLER BEARINGS ROLL THE LOAD

TRADE-MARK REG. U. S. PAT. OFF.

For more facts, use Request Card at page 18 and circle No. 348

END that Costly Scrap Heap

with pm Barricade Kits you can replace the damaged parts!

Yes, PM Barricade Kits give you the most flexible replacement system ever devised for barricades. You just replace the damaged part and your barricade is back in business! *An extra job profit of $5.00 per barricade per month for you!*

PM Transistor Neon or Incandescent Flasher Warning Lights put profit in your pocket, too! They're lighter, brighter, require less maintenance.

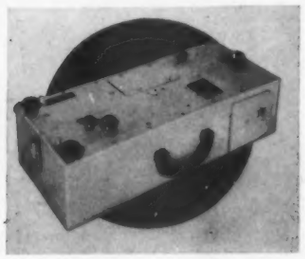
Write for free demonstration. There's a PM Field Engineer near you.

Pacific Mercury
14052 Burbank Blvd.
Van Nuys, Calif.

Manufacturers of the Thomas Electronic Organ

For more facts, circle No. 347

New portable seismograph records blast vibrations



A portable blast and vibration seismograph is available from the W. F. Sprengnether Instrument Co.

The instrument is designed to provide accurate, permanent records of vibrations caused by such operations as blasting and pile driving. The company points out that these records are valuable both for analyzing the vibrations and in case of litigation.

No technical training is required for operation of the instrument, which can be set up in minutes. It is completely self-contained in a rigid aluminum carrying case measuring 25×10×8 inches, and it weighs 38 pounds.

For further information write to the W. F. Sprengnether Instrument Co., Dept. C&E, 4571 Swan Ave., St. Louis, Mo., or use the Request Card at page 18. Circle No. 49.

A prime feature of the Caterpillar No. 619 tractor-No. 442 scraper combination is its ability to operate safely and effectively at high speeds. Other features include easy loading, uncomplicated servicing, and a turbocharged engine that develops 225 horsepower.

Several features offered by tractor-scraper unit

The Caterpillar Tractor Co. announces the No. 619 wheel tractor-No. 442 scraper combination. This new machine makes available a 2-wheel rubber-tire haul unit in the same size class as the company's DW15 wheel tractor.

Designed to operate safely and effectively at high speeds, the tractor is powered by a 225-hp turbocharged diesel engine, especially matched in power-output to the demands of the 14-cubic-yard struck capacity of the No. 442 Series B scraper. The engine develops maximum rated horespower at 2,000 rpm and furnishes a top speed of 30.2 mph.

Easily accessible, the tractor's transmission, differential, and cable control can be removed as a single unit by one man in approximately 30 minutes; the cable control alone is removable in 10 minutes. The clutch may be taken out by one man in approximately 30 minutes without removing the engine. The engine itself can be completely removed in approximately 3 man-hours.

The No. 442 Series B Lowbowl scraper has a capacity of 18 yards heaped. Cable-operated, it features positive controlled dozer-type ejection, an apron opening of 5 feet 4 inches, adjustable scraper axles to level the bowl, and wide-section tubeless tires.

For further information write to the Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the Request Card at page 18. Circle No. 82.

For further information on any product described in this section, circle the indicated number on the Request Card at page 18.

Faster CURB and GUTTER LAYING

Smith-Field Automatic Curb and Gutter Machine in operation.

at LESS COST

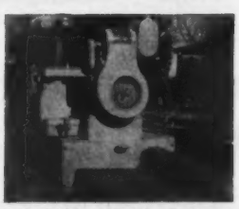
NO HAND FINISHING!
NO FORMS!

Lay up to 1,200 feet of integral curb and gutter per day — with no forms or hand finishing. The Smith-Field Automatic Curb and Gutter Machine is doing just that for cities, contractors, builders over the world. Savings of time, labor and material mean money on any job anywhere. The Companion machine — Stephens-Canfield Automatic Curber — lays curbing with the same dispatch, reaching as high as 3,000 feet per day.

The Smith-Field Automatic Curb and Gutter Machine uses Portland Cement Concrete. The Stephens-Canfield Automatic Curbers work equally well with either cement or asphalt mix.

TYPICAL MOLD SECTIONS—65 OTHERS AVAILABLE

LEARN about the savings — the efficiency of these machines. Write for full details and prices.



Smith-Field Automatic Curb and Gutter Machine — Model Mark 5

Stephens-Canfield Automatic Offset Curber — Model 56W

Stephens-Canfield Automatic Curber — Model 55A

E. L. HARDIN ASSOCIATES, INC.

For more facts, use Request Card at page 18 and circle No. 349

STOP LEAKAGE with SIKA QUICKSETS

SIKA No. 2

. . . for high pressure leakage thru concrete in deep basements, tunnels, shafts and foundations. Mortar will set in 15-30 seconds - forms plug that bonds tightly. Will not wash away.

SIKA No. 4A

. . . for slow leaks and seepage thru concrete or masonry. Cement mortar sets in 45-60 seconds - bonds tightly to wet leaking masonry. Dilute with water to change speed of set.

OTHER SIKA QUICKSETS

SIKA No. 3 — For Fast-Setting Pointing Mortar

SIKA No. 4 — For Grouting Against Running Water

SIGUNIT — For Fast Setting Air Placed Mortar

Sika SIKA CHEMICAL CORPORATION
PASSAIC · NEW JERSEY
COMPOUNDS FOR MASONRY and CONCRETE CONSTRUCTION

RELIABILITY • EXPERIENCE • SERVICE

For more facts, use Request Card at page 18 and circle No. 350

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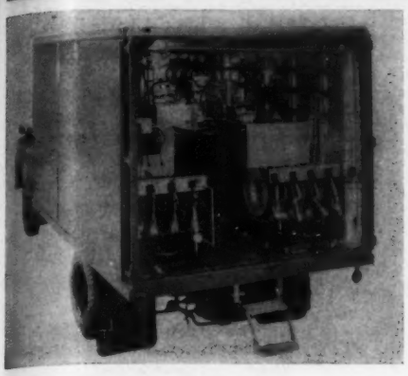
For more data on any item, circle indicated number on card at page 18.



Available on a custom-built basis, Lube-Vans are designed to combat down-time and extend equipment life by furnishing round-the-clock lubrication on the road or in the field.

Mobile lubrication vans are tailored to needs

Custom-built Lube-Vans, designed to provide complete lube service facilities in a compact mobile unit, are announced by The Aro Equipment Corp.

The unit is self-sufficient, equipped with air compressor and generator. Other equipment includes pumps and reels of heavy-duty all-weather type, specialized for contractor needs.

The van has storage space for filters and other replacement parts, as well as floodlights for night work. It is fully enclosed to protect lubricants from weather and contamination, and it provides all required services — engine oils, gear, chassis, track, hydraulic, water, air, and solvent. An air hoist with trolley simplifies loading.

For further information write to The Aro Equipment Corp., Dept. C&E, 1949 Erie Ave., Bryan, Ohio, or use the Request Card at page 18. Circle No. 10.

Whiteprint machine is easily portable

Grico, Inc., announces a small portable rotary diazo whiteprint machine known as the Satellite. The unit measures 45×5×5 inches, weighs less than 30 pounds, and can be wall-mounted or placed on a small desk or table. Plugged into any 115-volt outlet, it is immediately ready for operation.

The Satellite produces whiteprints of any length, and through 30 inches in width, from any translucent original.

One convenient front dial with selective speed variations permits exact exposures. A reversal control provides for emergency return.

For further information write to Grico, Inc., Dept. C&E, 1279 Munroe Falls Ave., Cuyahoga Falls, Ohio, or use the Request Card at page 18. Circle No. 4.

IT's NEW - - - The Campbell Sliding Cab

for the models HU, HH, HO, H70, and H90 "Payloaders" ! ! !

This sturdy, modern design offers features long desired by "PAYLOADER" operators, among them—Sliding top, ball bearing mounted on steel channel—Rubber seals to insure weather tightness—Permanently mounted access ladder —Rear view mirror—Tinted safety glass windshield and skylight.

Investigate this completely new design in "Payloader" Cabs by calling your "Payloader" distributor, or contact

CAMPBELL DETACHABLE CAB CO.
WAUCONDA, ILLINOIS
For more facts, use Request Card at page 18 and circle No. 351

A Fruehauf Dump-Trailer For Every Tough Job!

Do The Work of Two or More Trucks—At Less Cost—With One of These Fruehauf Trailers

Cable Dumps—Simple mechanism—low initial cost—low upkeep—full use of bridge formula laws—low Trailer weight—up to 4,000 pounds of extra payload—unmatched maneuverability on rough ground or in tight places. Trailer can be dumped with tractor jackknifed up to 90° angle—cable mechanism can be used to pull either tractor or Trailer out of rut or hole—single or tandem axle units available.

Hoist-Type Dumps—Wide range of designs—steel units (shown above) or frameless aluminum units (shown below) with up to 3,500 weight savings—single or tandem axle suspensions—single or twin front-mounted or under-mounted telescopic hoists—sand and gravel units or rugged rock bodies.

Hopper-Type Dumps—For sand, gravel, aggregates—frameless high-tensile steel body—designed for the strain of rough terrain—steeply-pitched inner surfaces for fast unloading—gate trip mechanism with ten control settings for varied unloading speeds.

FRUEHAUF ALSO BUILDS A FULL LINE OF CARRYALLS, PLATFORMS, AND CEMENT AND HOT COMMODITY TANKS FOR CONSTRUCTION WORK!

FRUEHAUF TRAILERS

For Forty-Five Years— More Fruehauf Trailers On The Road Than Any Other Make!

World's Largest Builder of Truck-Trailers
FRUEHAUF TRAILER COMPANY
10949 Harper Avenue • Detroit 32, Michigan

Send Free, Illustrated Literature, With No Obligation, On Units Checked:

☐ Cable Dumps ☐ Hoist-Type Dumps
☐ Hopper-Type Dumps Other_____

NAME_____
ADDRESS_____
COMPANY_____
CITY_____ STATE_____

For more facts, use coupon or Request Card at page 18 and circle No. 352

A high-capacity batching plant providing a capacity and quality of concrete unobtainable from local sources was instrumental in securing a 60,000-cubic-yard concrete job at Luke Air Force Base, Glendale, Ariz., for the Job Concrete Construction Co., Pomona, Calif. The plant, made by The Noble Co., produces up to 200 cubic yards per hour, with daily output as high as 1,000 cubic yards. With recorder and other automatic controls to meet Corps of Engineers specifications, the plant has a 500-barrel-capacity overhead cement silo, a separate 4-compartment 150-ton-capacity overhead aggregate bin, and a 4-cubic-yard batcher that batches cement and aggregate simultaneously. A second overhead cement silo can be added, using the existing vertical cement elevating screw. For further information write to **The Noble Co.**, Dept. C&E, 1860 Seventh St., Oakland, Calif., or use the Request Card at page 18. Circle No. 28.

Loader lifts 4,000 lbs. to a height of 30 feet

The Lull Engineering Co. has introduced an improved version of its high-lift loader that will lift 4,000 pounds up to 30 feet.

Standard improvements of the Model 7B all-purpose Hi-Lift include: a stronger telescopic tower yoke that permits lifting the maximum load through the entire lifting height of 30 feet; driving axles and housings heavily trussed and braced and positioned farther out into the traction wheels to provide greater stability with less weight; improved torque

FLECO.

LAND CLEARING SPECIALISTS

Avon Construction Co. clears land for a housing development with a No. 955 Traxcavator and Fleco Rake. Fast-acting hydraulic controls permit dirt to be shaken from stumps for better burning, easier loading.

ADD NEW JOBS TO YOUR TRAXCAVATOR'S CHORES

. . . and add new profits to your pocket with a Fleco Traxcavator Rake

You'll be amazed how a Fleco Rake increases the profitable work range of your Traxcavator. Clearing land for industrial, building or agricultural use becomes a simple and money-making operation. High lift makes loading easy, gives high leverage for prying out trees. Properly spaced teeth permit raking, stacking, grubbing and carrying of big loads of brush, trees, stumps and the like while soil sifts through. Stacks and piles are practically dirt free, burn faster, more completely. Versatile, profitable Fleco Rakes replace the bucket on your No. 977, No. 955, No. 933, No. 6 or HT4 Traxcavator.

High lift provides maximum leverage for prying loose root system, simplifies loading of debris. Teeth slide under the roots and pry up as the Rake tilts back.

Fleco Cab Guards increase operator safety. Available for all Caterpillar track-type Tractors, Fleco Cab Guards provide unobstructed 360° visibility and production-increasing protection.

FLECO®

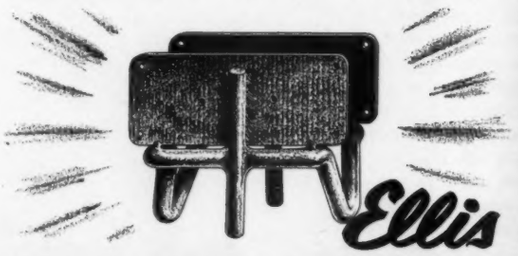
Rock, Root, Brush and Traxcavator Rakes • Tree Cutters • Stumpers • Undercutters • Cab Guards • Rootcutters • Root Plows • Tree Dozers • Rolling Choppers • Heavy-duty Tool Bars.

Your Caterpillar-Fleco Dealer can tell you of the many ways a Traxcavator Rake can earn for you. Just ask him.

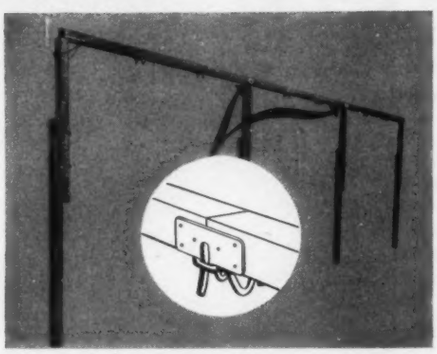
FLECO Corporation
P.O. Box 2370, Jacksonville, Florida
Fleco International, Inc. • Fleco Overseas Limited
P.O. Box d20, Nassau, N. P. Bahamas

For more facts, use Request Card at page 18 and circle No. 353

NOW—A METAL CLEAT AND SLIP-IN SHORE HOLDER
Combined in One New Part...



PURLIN SPLICER



THE ELLIS METHODS OF SUSPENDED REINFORCED CONCRETE CONSTRUCTION

introduce still another new and better way to erect a forming assembly! Using 12-foot or other convenient length sticks, purlins may be extended as desired . . . joined together by the new Ellis Purlin Splicer. The underneath side of the splicer is a slip-in shore holder, while regular slip-in shore holders are spaced at 4-foot intervals on the purlins. End shores fit into Ellis Head Clamps. The basic unit is quickly erected and slip-in shores added . . . another example of S-E-A-S . . . Safety, Economy, Adaptability, Speed! Write for details.

ELLIS MFG. CO.
INCORPORATED
211 N.W. 4TH ST. • OKLAHOMA CITY, OKLAHOMA

For more facts, use Request Card at page 18 and circle No. 354

The improved Model 7B Hi-Lift now lifts 4,000 pounds of building materials to a height of 30 feet.

converter controls; a larger clutch; a new easy transmission shift and lever guides for both the standard and torque-converter models; and a raised operator platform to provide better visibility.

New attachments include a telescopic boom that can be hydraulically extended or retracted from 13 feet to 8 feet, with a full lifting height of 30 feet; a hydraulically controlled winch for use with the boom; and a hydraulically controlled concrete dumping bucket. All the attachments are controlled from the operator's seat.

For further information write to the Lull Engineering Co., Dept. C&E, 3045 Highway 13, St. Paul, Minn., or use the Request Card at page 18. Circle No. 81.

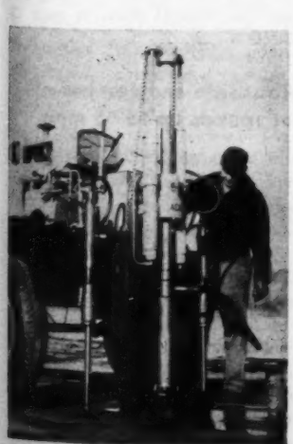
Portable pavement drill in high-capacity unit

The Acker Drill Co., Inc., announces an all-new portable drill designed exclusively for pavement test coring.

The rig is said to have a production capacity of up to 65 quality test-core samples per 8-hour shift. It is self-contained, completely portable, and trailer-mounted for easy towing.

Standard equipment includes an adjustable core-barrel guide to simplify the drilling operation.

For further information write to the Acker Drill Co., Inc., Dept. C&E, P. O. Box 830, Scranton 2, Pa., or use the Request Card at page 18. Circle No. 46.



Designed exclusively for pavement test coring, this Acker portable drill has a reported capacity of up to 65 core samples per 8-hour shift.

For more facts, circle No. 355→

Power rammer features automatic lubrication

The Maxtamp power rammer, featuring built-in automatic lubrication and positive carburetion, is available from the Complete Machinery & Equipment Co., Inc.

The compact unit weighs 220 pounds, and develops 311 foot-pounds per blow. According to the manufacturer, the rammer is designed to operate effectively under the most difficult conditions, and positive control is always assured. Careful attention to the height and position of the handles is said to reduce operator fatigue and increase work output. Average number of jumps per minute is 80.

Other specifications include a height of 3 feet 11 inches, width of 1 foot 8 inches, and a 1-foot 2-inch depth.

It is necessary to remove only three nuts for routine overhaul.

For further information write to the Complete Machinery & Equipment Co., Inc., Dept. C&E, 36–40 11th St., Long Island City 6, N. Y., or use the Request Card at page 18. Circle No. 115.

5 Lorains pay off for J. & S. Construction Company

Working on a $1,700,000 sewer job . . .

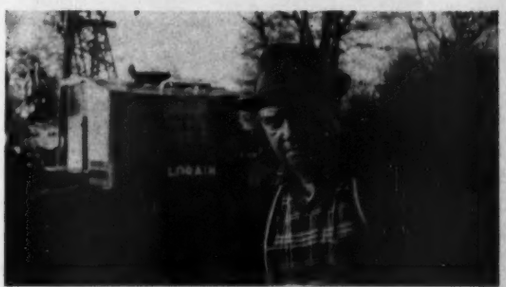
3/4-YARD LORAIN-26 HELPS COMPLETE UP TO 600 FEET OF PIPE DAILY

Over 24 miles of 8-inch to 30-inch pipe, plus 10,000 feet of 4-inch laterals, will be installed by J. & S. Construction Company, Inc. of Eatontown, N.J. Their Lorain-26 helps dig trenches ranging from 6 to 26 feet deep, 3 to 4 feet wide. The L-26 lines the bottom with stone, lowers pipe into the trench and backfills. Average production ranges from 200 to 600 feet of pipe each 9-hour day, depending on pipe size.

"Joy-Stick control boosts production up to 5% over manual control," reports Albert Payakovich, operator of all types of equipment for 12 years. "With two-lever, 'Joy-Stick' control, I do as much work during the last few hours as I did at the start of the day."

Get this Lorain-26 performance. Whether you buy it as a shovel, dragline, clamshell, hoe or crane you select the "package" best suited for your needs. You'll get more for your money. See your Lorain distributor for a quotation.

THE THEW SHOVEL COMPANY, LORAIN, OHIO



"This Lorain loads 6-yard trucks in 2 to 3 minutes." So reports J. Sprague, owner. "Ever since I started in business 15 years ago I've been using Lorains. They are fast machines, economical to run, need little maintenance. They're good for our type of work."

LORAIN®
ON THE MOVE

Ask your nearby Lorain distributor for the full story —and about his on-the-spot parts and service facilities that add so much when you buy Lorain.

To obtain further information on products described in this section, circle the number at the end of the item on the Request Card at page 18.

WINSLOW—PORTABLE TRUCK SCALE

THE CONTRACTORS' SPECIAL SCALE

For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Capacity: 15-18-20-30, 40 and 50 tons.

Write us for name of your nearest distributor

WINSLOW SCALE COMPANY P.O. Box 1198 Terre Haute, Indiana

For more facts, use Request Card at page 18 and circle No. 356

For use with Ford tractors, the Dearborn Earthcavator can be rotated to 3 positions: grade, scarify, or backfill. It is available in 65, 72, and 80-inch models.

Five new attachments offered for tractors

Five new attachments for material-handling and earthmoving jobs are announced by the Tractor and Implement Division of the Ford Motor Co.

These include a new rear-mounted reversible scoop, universal dozer blades, a new Dearborn scraper, landscapers, and Earthcavators.

The scoop attaches to the rear 3-point implement linkage of any Ford tractor and carries up to 10 cubic feet of earth. Possessing a heavier main frame than previous models, its greater strength enables its use on the largest and most powerful Ford tractors. A positive latch quickly re-sets and locks after dumping the load. The implement has a 6-inch digging depth and 8-inch dump-height clearance, and it can be reversed.

Both a 6 and a 7-foot universal dozer blade for use with the firm's loaders are available.

The 65-inch Dearborn scraper and 65 and 72-inch landscapers are rear-mounted box-type scrapers with side plates, scarifying teeth, and a hinged blade for back filling. These units can scarify and grade in one operation.

The Dearborn Earthcavators of 65 and 72 inches for use with Ford tractors, and an 80-inch model for the Fordson Power Major diesel tractors, are rear-mounted scrapers with scarifying teeth. They can be rotated to 3 positions: grade, scarify, and backfill.

For further information write to the Tractor and Implement Division, Ford Motor Co., Dept. C&E, 2500 E. Maple Road, Birmingham, Mich., or use the Request Card at page 18. Circle No. 27.

McConnaughay WEATHER-PROOF EMULSIFIED ASPHALTS

Plant Mixes

Application Types

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BITUMINOUS PAVING CONTRACTORS...

Our plans for expansion now warrant the licensing of qualified contractors in the Pacific, Rocky Mountain, and Southwestern States. Investigate the advantages of being a McConnaughay Licensee.

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E. A. Mariani—Emulsified Asphalt
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Emulsions, Inc.—*Lawrenceville*

INDIANA
Bituminous Materials Co.
P. O. Box 1140, *Terre Haute*
Wabash Valley Asphalt Co.
Terre Haute
Walsh & Kelly
R. R. No. 2, *Gary*
Brookman Construction Co.
17th & Gharkey Sts., *Muncie*
Fauber Construction Co.
Lafayette
Asphalt Materials & Construction, Inc.
960 East 22nd, *Indianapolis 2*

IOWA
Bituminous Materials & Supply Co.
409 Fifth Street, *West Des Moines*
Plants: *Spirit Lake, LeMars, Carroll, Algona, Lehigh, Davenport*

KENTUCKY
Emulsified Asphalt Co.—*Kuttawa*

LOUISIANA
Bituminous Materials Co.—*Metairie*
Serving Alabama, Mississippi, and Louisiana

MAINE
Doherty and Swearingen Co.
53 Main St., *Yarmouth*

MASSACHUSETTS
James Huggins & Sons, Inc.
Medford & Commercial, *Malden 48*

MICHIGAN
Bituminous Materials Co.
318 Atlantic St., *Bay City*
Bituminous Materials Co.- *Escanaba*
Bituminous Materials Co.
416 S. Water St., *Jackson*

NEW YORK
Knight Paving Products, Inc.
1655 Union Rd., *Gardenville*
Knight Paving Products, Inc.
Vine Street, *Ithaca*
Knight Paving Products, Inc.
1980 East Avenue, *Rochester 10*
Knight-Bitumen Corp.—*Watertown*
Albany Asphalt & Aggregates
75 State St., *Albany*
Bimasco, Inc. *(2 plants)*
312 Brook Street
Bayshore, L. I., N. Y.

SOUTH CAROLINA
Seaco, Incorporated
2700 Industrial Drive, *Columbia*

TENNESSEE
Asphalt Products Co., Inc.
Powell Ave., *Nashville 4*

CANADA
T. J. Pounder & Co., Ltd.
1474 Wall St., *Winnipeg, Man.*

Eastern Representative:
John A. Dow
157 Church St., *New Haven 10, Conn.*

K. E. McCONNAUGHAY LAFAYETTE INDIANA
EMULSIFIED ASPHALT PLANTS AND PROCESSES

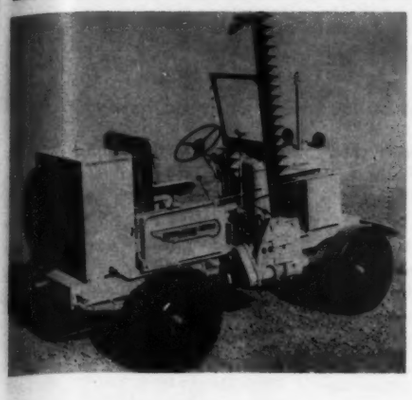
For more facts, use Request Card at page 18 and circle No. 357

Roadside mower travels at speeds up to 45 mph

A newly designed roadside mower with hydraulic actuation is announced by Topeka Hiway Mower, Inc.

According to the manufacturer, the Topeka Forty Mile mower is not a tractor attachment but a completely integrated machine designed for fast and economical mowing. Of special interest is the fast on-and-off chemical power sprayer attachment, which sprays weed-killing chemicals along the fence line as the machine mows.

The heavy channel frame construction permits the use of a front-end loader for stockpile work. One man



Travel speeds of 40 to 45 mph and mowing speeds from 1 to 10 mph are possible with the new Topeka mower.

reportedly can attach or remove the hydraulic moving mechanism in 10 minutes.

The unit offers road travel speeds of 40 to 45 mph and mowing speeds from 1 to 10 mph.

A full 170-degree cutting action is a feature; the sickle cuts downward at as much as an 80-degree angle and upward at as much as a 90-degree angle, for mowing over problem terrain.

For further information write to Topeka Hiway Mower, Inc., Dept. C&E, 700 E. Eighth St., Topeka, Kans., or use the Request Card at page 18. Circle No. 23.

Convertible masonry saw can be used wet or dry

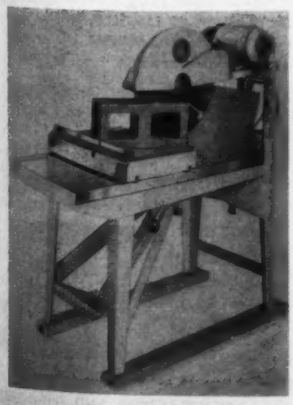
The new Felker Touch-A-Matic masonry saw is designed to rip a 16-inch concrete block from one corner diagonally to the other in a single pass. For use with the 20-inch Di-Lock diamond blade, it can also be used with blades as small as 14-inch diameter.

The machine possesses all front-end controls, permitting all head adjustments and other changes from the operator's position.

Equipped with a recirculating pump, the Touch-A-Matic can be used either wet or dry. Power is supplied by lightweight motors of 1½, 2, or 3 horsepower, which develop as much as 8 horsepower on peak loads, with intermittent operation.

The Touch-A-Matic can be used on either 110 or 220-volt ac.

For further information write to the Felker Mfg. Co., Dept. C&E, 1125 Border Ave., Torrance, Calif., or use the Request Card at page 18. Circle No. 67.



For more facts, circle No. 358→

Compact new feeder is easily installed

A compact new packaged feeder that can be installed in only two steps is offered by the Fuller Co.

Designed to facilitate the introduction of material into any kind of air-pressure conveying unit, the feeder can be adapted to small as well as large operations. It will handle any material that can be conveyed pneumatically, and will feed from bin, hopper, or conveyor. Flexibility of installation is provided by the fact that it can either be hung from a hopper or supported on its own base or stand.

Capacity is variable, depending on the type of installation and material being handled. The unit is available in ½, ¾, and 1-hp models.

For further information write to the Fuller Co., Dept. C&E, 124 Bridge St., Catasauqua, Pa., or use the Request Card at page 18. Circle No. 97.

ANOTHER RUSH JOB...
another EUCLID job!

S. J. Groves using 67 "Eucs" at Bong Air Force Base

At Kansasville, Wisconsin, the new Bong Air Force Base is being rushed to completion for the Strategic Air Command. Earthmoving and paving work on this 5,440 acre base was awarded to S. J. Groves and Sons Company and is under the supervision of the Chicago District Corps of Engineers. Nearly 14 million cu. yds. of excavation will be moved prior to the contract completion date.

In spite of the tight schedule, grading is well ahead of the timetable. With 2-shift operation, efficient job management and a large fleet of modern earthmoving equipment, Groves moved 8½ million cu. yds. in 4 months. A total of 67 Euclid units... more than 3 times the number of other big rubber-tired haulers on the job... are making the dirt fly! A long-time Euclid owner, Groves acquired six Model TS-24 "Twin" Scrapers to supplement their Euclid fleet at Bong. These big scrapers, with 2 engines and all-wheel drive, can work without the assistance of pusher tractors... have already played an important part in keeping the earthmoving well ahead of contract schedule.

On big rush jobs like this one, or on smaller projects, too, modern Euclid equipment maintains high production at low cost. Have the dealer in your area give you the facts and figures that prove *Euclids are your best investment.*

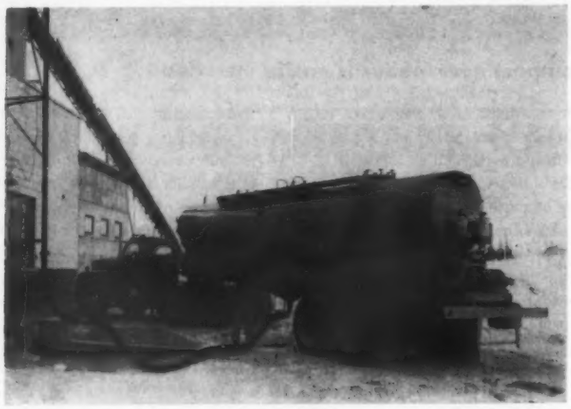
EUCLID Division of General Motors, Cleveland 17, Ohio

Groves is using 32 Bottom-Dump Euclids at Bong . . . 10 have struck capacities of 13 cu. yds. and the others are 17 yd. units. Pavement-smooth haul roads enable the Bottom-Dumps to take full advantage of their fast travel speeds for high production.

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE



Pneumatic unloading of bulk cement can be accomplished with the blower mounted on the rear of the pressure tank and activated by a gasoline-driven engine.

Tank trailer unloads bulk cement pneumatically

A new bulk-haul tank trailer, capable of pumping cement a distance of 105 feet or more, is announced by the Fruehauf Trailer Co.

Pneumatic unloading is accomplished with a blower mounted on the tractor and connected to the power-takeoff shaft. An optional discharge method has the blower mounted on the rear of the pressure tank and activated by a gasoline-driven engine.

Discharge rate is said to be 3.33 barrels per minute through a 4-inch hose. At a pressure of 11 pounds, cement is pneumatically conveyed a distance of 20 feet horizontally and 85 feet vertically directly into a storage elevator.

The unit is available with capacities from 105 to 120 barrels.

For further information write to the Fruehauf Trailer Co., Dept. C&E, 10923 Harper Ave., Detroit 32, Mich., or use the Request Card at page 18. Circle No. 29.

Vibrator for big jobs features 21-inch head

The Model DHC-300 Texan, a 43½-pound vibrator with a head length of 21 inches and a diameter of 4 inches, is offered by Dart Mfg. & Sales Co.

The unit operates on 180-cycle current, is available in either 115 or 230 volts, and utilizes a rotary centrifugal eccentric. It reportedly exceeds specifications for both frequency and amplitude in heavy-aggregate, low-slump concrete. Rpm under full load at 183 cycles is 10,800. The motor has a normal output of 1,920 watts.

A key feature is the easily removable motor section.

The Texan may be operated singly on a 3-kw generator or used in gangs for big screeding operations with a larger generator.

For further information write to the Dart Mfg. & Sales Co., Dept. C&E, 1002 S. Jason St., Denver 23, Colo., or use the Request Card at page 18. Circle No. 43.

NEW

TROUBLE-FREE STEAM CLEANER

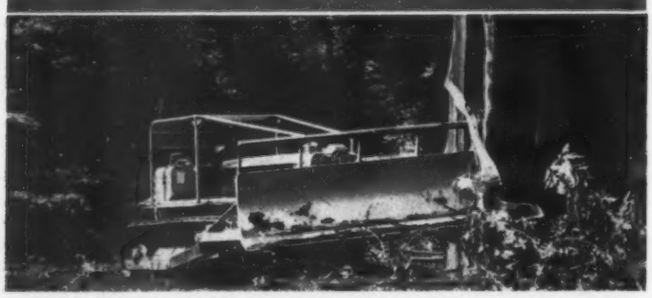
The Turbo Steam Cleaner is made for continuous rough service. It takes care of all cleaning, degreasing, paint-stripping and phosphatizing jobs faster, better and cheaper than any other steam cleaner. Quickly pays for itself: Low fuel consumption; detergent savings; low maintenance. Simple construction. Many automatic safety features. Nothing cleans like steam and no steam cleaner cleans like a Turbo. Oil-fired and electric models. Send for illustrated folder.

TURBO STEAM CLEANERS

TURBO MACHINE COMPANY
LANSDALE, PA.

For more facts, circle No. 360

CLEAR LAND THE ROME WAY



SPLIT THE BIG ONES – Rome K/G Clearing Blade fells any size tree. Big ones are split into smaller segments with sharp "stinger." Guide bar above blade fells trees forward and to right.

SHEAR OFF AT GROUND LEVEL – Knife-sharp cutting edge shears stumps cleanly at ground level or below. A blade width of brush and small trees is cut in one pass. Topsoil is undisturbed.

BUILD FAST-BURNING WINDROWS – Without big balls of roots and dirt, trees are easily stacked in compact pile that burns clean and quick. Same tool cuts *and* stacks. Get full details from your Rome-Caterpillar Dealer now! Rome Plow Company, Cedartown, Georgia.

ROME.

YOUR ROME DEALER IS YOUR CATERPILLAR DEALER

For more facts, use Request Card at page 18 and circle No. 359

NEW SOIL SAMPLING BOOK AVAILABLE!

★ 68 Pages ★ 16 Chapters
★ Over 100 Photos and Drawings

Here's a non-technical book that provides 68 illustrated pages of the latest methods, procedures and tools for sampling.

This is a "how to" book—an easy-to-follow guide for the builder, construction contractor, civil engineer or architect. If you need fundamental soil sampling information, this book is for you.

For only $1.00, a fraction of the preparation and printing costs, we'll rush you a postpaid copy of "Basic Procedures of Soil Sampling." If not completely satisfied, return the book within seven days, for full refund.

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Gentlemen:
Here's my check for $1.00. Rush me a copy of "Basic Procedures of Soil Sampling."
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City.....State.....

ORDER YOUR COPY TODAY!

For more facts, use coupon or Request Card at page 18 and circle No. 361

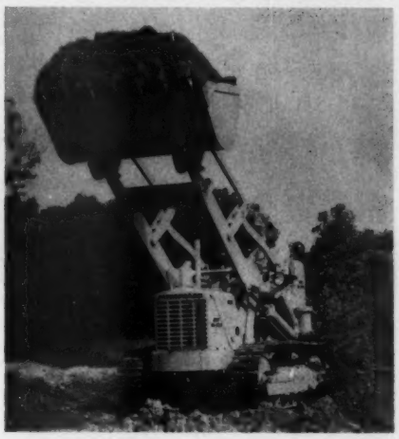
Self-propelled compactor has electric-motor drive

The Maginniss self-propelled vibratory compactor is available with a 3-hp 110/220/440-volt 60-cycle 3,450-rpm single or 3-phase electric motor.

The manufacturer states that the electric-motor-driven Powr-Pactor has a fixed vibrating frequency of 6,500 vpm and a compacting force of 4,000 pounds. It will travel up to 50 fpm. Damping springs isolate the 12×18-inch compacting plate from the rest of the machine. Two dolly wheels facilitate moving it into place and out of corners. A water-feed attachment and wide-rim steel rollers in place of the dolly wheels are available for hot-mix asphalt applications.

For further information write to the Maginniss Power Tool Co., Dept. C&E, 154 Distl Ave., Mansfield, Ohio, or use the Request Card at page 18. Circle No. 56.

For more facts on these products, circle the indicated number on the Request Card at page 18.

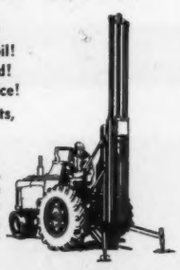


Designed as an all-around digging and loading machine, the new Caterpillar No. 933 Series F Traxcavator features a 4-cylinder engine rated at 52 flywheel horsepower. Other improvements include an increased reverse speed of 3.67 mph, a 1⅛-cubic-yard heavy-duty bucket, and an operator's compartment built for maximum comfort. For further information write to the **Caterpillar Tractor Co.,** Dept. C&E, Peoria, Ill., or use the Request Card at page 18. Circle No. 87.

PREWITT DIGGERS
CUT JOB COSTS!

INDUSTRIAL
- Dig ANY Soil!
- Positive Feed!
- Economy Price!

Ideal for poles, posts, pier-holes.



New INDUSTRIAL DIGGER cuts up to 6½ feet through clay, shale, gumbo, tree roots and frozen ground.

HORIZONTAL
- Straight Holes!
- Holds to Grade!
- Own Power Plant!

Designed for mains, underground lines.

Tough HORIZONTAL DIGGER drills straight holes up to 48 feet through ANY soil. Skid-mounted, ready to go.

DEALERS INVITED — *Write for FREE Literature*

J.R. PREWITT AND SONS, INC. Manufacturers Since 1929
Pleasant Hill, Missouri
Phone 40
Dept. EC

For more facts, circle No. 362

$AVE
***money**. . .the new 1959 J-18 gives you three times more tamping speed and efficiency than any other similar equipment on the market today at the same low cost of a 1958 Jay Tamper.*

$AVE
***time** . . . featuring a faster and more positive tamping action than any similar equipment. The J-18 lets you tamp 2500 high impact blows per minute as opposed to some other equipment delivering 60 blows per minute.*

$AVE
***manpower** . . . on many jobs one man, with a Jay can compact as large an area as fifteen men working with air tamps or rammer type equipment.*

"THE BEST ON EARTH!"

J-18

"JAY" COMPANY
. . . the first and oldest producer of equipment of this type gives **quality** *above all.*

J-18 compacting large pipeline trench.

3 models to choose from
J TAMP J 18 J 36

THE "JAY" Company
Compaction Pioneering Specialists
2222 SOUTH THIRD STREET, COLUMBUS 7, OHIO

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THE "JAY" COMPANY
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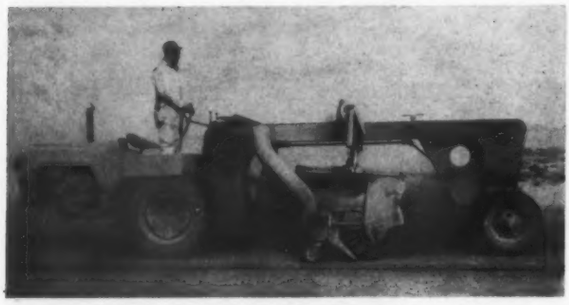
☐ *Send us further information about the new J-18*

INDIVIDUAL NAME AND TITLE
COMPANY NAME
ADDRESS
CITY ZONE STATE

For more facts, use coupon or Request Card at page 18 and circle No. 363



A broom-width jet air stream applied by the Broom-Master's built-in blower increases the effectiveness of the sweeping job. The blower is powered by a V-belt drive from the tractor's power takeoff.

Self-propelled sweeper features built-in blower

A one-man-operated self-propelled power broom named the Broom-Master is announced by Flaherty Mfg., Inc.

Featured is a built-in blower powered by a V-belt drive from the tractor's power takeoff. A jaw clutch permits the broom to operate independent of the blower.

Other design features include positive broom setting to insure minimum core wear; Ampli-Torc drive, which permits high or low speed range in each of 6 gears (5 forward and 1 reverse); and a 240-gallon water tank.

For further information write to Flaherty Mfg., Inc., Dept. C&E, P. O. Box 1042, Pocatello, Idaho, or use the Request Card at page 18. Circle No. 26.

Rotary air compressor has capacity of 75 cfm

A rotary air compressor that delivers 75 cfm at a constantly maintained 100 pounds of pressure is offered by The Jaeger Machine Co.

The unit is oil-cooled, powered by a Continental F140 gasoline engine, and has a full-load speed of 1,750 rpm. Simple, instant-acting precision

controls insure constant air pressure under all normal demands and prevent overrun and engine racing, according to the manufacturer.

Toolboxes are big enough for a full set of tools.

For further information write to The Jaeger Machine Co., Dept. C&E, 550 W. Spring St., Columbus 16, Ohio, or use the Request Card at page 18. Circle No. 55.

Electric power plant for remote locations

A 64-pound electric power plant designated Zeus is announced by the Borg-Warner Corp.

Powered by a Briggs & Stratton or Clayton engine, the unit is designed to furnish premium or emergency ac power for lights, appliances, or tools in remote locations.

According to the manufacturer, a permanent-magnet alternator, connected directly to the engine, generates full power for long periods of continuous running without voltage loss or overheating. A Fiberglas cover

GAR WOOD "ST" TRUCK CRANES are the most modern on the market. From custom-built carrier with high-speed mobility... through 3-shaft machinery deck, arranged pyramid fashion for easy accessibility to every gear, drum, brake and clutch... to positive controls that retain important operator "feel" of every operation, Gar Wood truck cranes combine precision performance with rugged dependability.

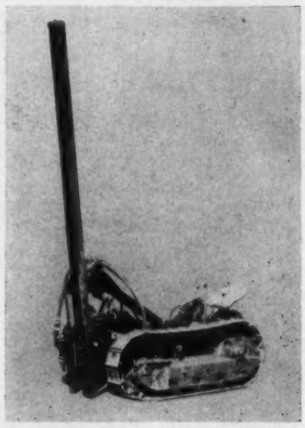
Advanced Engineeri

GAR WOOD - ST. PAUL TRUCK EQUIPMENT is built the way you'd expect world's leading manufacturer to build it: rugged enough to take the day-in out abuse of overhead loading; yet with a precision hydraulic system to h controlled dumping smoothly, accurately. It's the most advanced and com line of arm-type and front-mounted telescopic hoists, with matching bodie every job requirement.

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card that is bound in at page 18 of this issue.

protects the unit and adds to quiet operation. Due to the elimination of all brushes, slip rings, or commutator, no maintenance is required.

For further information write to Western Branch, Pesco Products Division, Borg-Warner Corp., Dept. C&E, 3310 Vanowen St., Burbank, Calif., or use the Request Card at page 18. Circle No. 53.



For use in tunnel work, this crawler jumbo is powered by a reversible, 15-hp piston-type air motor through a 3-speed transmission.

Crawler-drill-jumbo for use in tunnel work

The Machinery Center, Inc., announces a versatile crawler-drill-jumbo designed for use in tunnel work.

The jumbo can be mounted with one or two jibs for single or multiple-hole drilling. One man can operate the unit with complete independent positioning of the multiple jibs. Heavy-duty feed drills of straight or extendable types can be used for auger or percussion drilling. A wide selection of tools, from jackhammers to 4½-inch bore units, can be used.

The crawler jumbo is powered by a reversible 15-hp piston-type air motor through a 3-speed tractor transmission.

For further information write to the Machinery Center, Inc., Dept. C&E, 1201 S. Sixth West, Salt Lake City, Utah, or use the Request Card at page 18. Circle No. 118.

Lightweight power trench is multipurpose tool

A new ½-inch-drive heavy-duty electric Impactool is announced by Ingersoll-Rand.

Known as Size 5U-HD, it is 10¼ inches in length and weighs 6 pounds 4 ounces less cable. Side-to-center distance is 1 7/16 inch. The tool runs at 1,900 rpm. It is available for 110 or 220-volt operation ac-dc (25-40-50-60-cycle).

Although designed primarily for nut running, standard attachments make this Impactool a multipurpose tool.

For further information write to the Ingersoll-Rand Co., Dept. C&E, 11 Broadway, New York 4, N. Y., or use the Request Card at page 18. Circle No. 121.

New traction equalizer reduces vehicle skidding

A traction-improving device for both off and over-the-highway units is announced by the Transmission and Axle Division of the Rockwell-Standard Corp. Known as the traction equalizer, it reportedly will propel a vehicle even if one of the driving wheels is completely off the ground.

Because the unit is continually engaged and doesn't depend on the

driver for activation, it is automatically effective whenever one wheel tends to turn faster than the other.

Installation is said to be easy; the unit is self-lubricating; and since the differential nest remains standard, the only new parts required for installation are axle shafts and differential cases.

For further information write to the Rockwell-Standard Corp., Transmission and Axle Division, Dept. C&E, Detroit 32, Mich., or use the Request Card at page 18. Circle No. 62.

atures are "standard equipment" with GarWood-Buckeye!

Modern ditcher features pay off big in increased production, in ease of operation, and in low maintenance costs. And—there's no reason for you to pay "big" to get them! On advanced Gar Wood-Buckeye wheel-type ditchers, modern features like these are "engineered-in" as standard equipment at no extra cost:

HYDRAULIC CONVEYOR DRIVE—With three speeds in either direction to handle any volume of spoil regardless of digging wheel speed. Conveyor control is instantaneous, and independent of all other functions.

HYDRAULIC DIGGING WHEEL HOIST—Hydraulic system allows quick and precise adjustments for depth and grade independent of conveyor, travel or digging wheel speeds.

MODERN POWER TRAIN—Only Buckeye has a transmission specifically-designed for ditcher work! Power for traction and digging is transmitted through separate output shafts. You get more power where you need it—at the digging wheel. And with reduced fuel costs, too.

SIMPLIFIED GROUP CONTROLS—Operation is faster, easier and far more accurate because all controls are grouped for operator convenience. Speeds are easy to select and use. Hi-Lo traction speed greatly reduces shifting.

SPLIT-SHAFT EXCAVATOR DRIVE—Assures equal drive power to both sides of digging wheel. Maintenance is much easier and faster.

Only Gar Wood offers these advanced, high-performance features as standard equipment, *plus* exclusive factory customizing for every digging condition, every application. Don't settle for less than a *modern* ditcher. That's Gar Wood-Buckeye!

s off big in all Gar Wood equipment...

OD TRACTOR EQUIPMENT is engineered for dependable perform- h high-production Euclid Tractors like the 425 hp TC-12. Gar Wood ped such revolutionary design features as cable control units as an integral part of the tractor... Tipdozers with hammerhead-type ... Dozecasters with thrust arms attached by "deep-anchored" lugs.

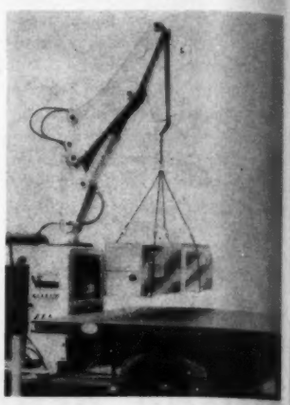
GarWood INDUSTRIES, INC.
Findlay, Ohio • Wayne, Michigan

For more facts, use Request Card at page 18 and circle No. 364

Any crown from straight to 3-inch can be obtained with the new Stow vibrating screed. Also, beams up to 40 feet long can be obtained and shipped easily to the job in two 20-foot sections. Said to be ideal for spans 25 feet and over, the screed has two 2½-hp Power Paks with built-in vibrators mounted on heavy brackets bolted to the beam. End roller assemblies, which include handles, support the beam at each end. They have special rollers that flip up to lift the beam off the surface of the concrete so that the screed can be easily rolled back to make a second pass. For further information on this adjustable-crown screed write to the **Stow Mfg. Co.**, Dept. C&E, 40 Shear St., Binghamton, N. Y., or use the Request Card at page 18. Circle No. 59.

Jib boom for truck crane increases load capacity

A hydraulically powered jib boom designed for the Daybrook power loader makes possible greater flexibility of use, more speed, and the ability to handle heavy bulky materials with precision accuracy in limited space.



The jib-boom unit utilizes the same hydraulic system as the standard hoisting unit, less the winch and cable. Load capacities range to a maximum of 7,000 pounds.

The jib-boom unit utilizes the same hydraulic system as the standard Daybrook power loader, less the winch and cable. It has load capacities ranging to 7,000 pounds maximum for loading a platform truck or for unloading and placing materials at elevated places or at ground or floor level. The boom has a full 360-degree rotation.

The jib-boom series is known as PL6J, with Model PL6JST having manual control and Model PL6JBC equipped with remote control.

For further information write to the Daybrook Hydraulic Division, Young Spring & Wire Corp., Dept. C&E, Bowling Green, Ohio, or use the Request Card at page 18. Circle No. 34.

Core drilling machine cuts smooth holes

A new tool said to eliminate the rough holes that result from breaking through common construction materials with conventional pneumatic equipment is announced by the Felker Mfg. Co.

The Core-Lock diamond drilling machine uses new heavy-duty surface-set diamond core drills, and is adjustable to feed at any angle within a full 360 degrees.

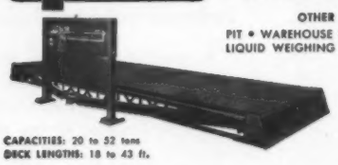
Construction features include a feed system that prevents the head from traveling down the track under its own weight; a safey collar on the column that prevents accidental runaway of sliding head; a telescopic extension within the column for vertical bracing; built-in casters for easy portability; and gibbed construction to maintain tight, wear-free action. A special vacuum attachment, clamping to the base, permits firm anchorage to any smooth surface, such as

MOVES with the JOB! NO CONCRETE PITS!

THURMAN Portable Truck Scale

OTHER THURMAN SCALES:
PIT • WAREHOUSE • INDUSTRIAL • WHEELBARROW
LIQUID WEIGHING • BATCHING • AUTOMATIC

Sets up in minutes . . . accurate, precision weighing *on-the-site*. Complete steel deck construction. Low original cost . . . no maintenance costs. Can be installed as a pitless scale. Saves pit costs. WRITE OR WIRE FOR BULLETIN 601



CAPACITIES: 20 to 52 tons
DECK LENGTHS: 18 to 43 ft.

Precision Scales THURMAN *Since 1918*

THURMAN SCALE COMPANY, 156 N. 5TH STREET
DEPT. CE-2, COLUMBUS, OHIO

For more facts, use Request Card at page 18 and circle No. 365

THE ROSS PORTA-PLANT TEAM . . . the perfect combination for complete read,-mix batching . . . high production at low initial cost. Portability is no side line with us. It is our only business . . . to build the FINEST PORTABLE BATCHING EQUIPMENT FOR THE CONSTRUCTION INDUSTRY . . .

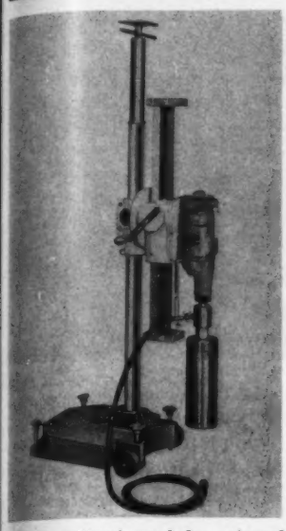
HIGH PRODUCTION . . . . ECONOMICAL . . . . VERSATILE

CONTACT US FOR THE NAME OF DEALER NEAREST YOU

ROSS PORTA-PLANT

BOX 446 PHONE: MI 5-2697 BROWNWOOD, TEXAS

For more facts, use Request Card at page 18 and circle No. 366



concrete, without need for external bracing.

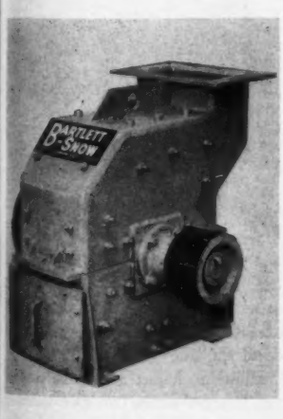
Motors in several horsepower ratings and drilling speeds are available.

For further information write to the Felker Mfg. Co., Dept. C&E, 1125 Border Ave., Torrance, Calif., or use the Request Card at page 18. Circle No. 136.

For more data on any item, circle indicated number on card at page 18.

New pulverizer features low power consumption

Low power consumption is a major benefit of the new Bartlett-Snow Cyclo swing-hammer pulverizer, which crushes almost entirely by impact. Offered in three models, these



machines are said to be ideal for crushing materials between 10 and 40-mesh size at rates up to 10 tph.

The one-piece hammers are of manganese steel and extend the full width of the crusher; the full weight of the hammers is used in crushing. Renewable breaker blocks, liners, hammers, and screens or grates are easily available for replacement or rebuilding.

Capacities range from 1 to 10 tph. Power requirements range from 5 to 20 horsepower.

For further information write to The C. O. Bartlett & Snow Co., Dept. C&E, 6200 Harvard Ave., Cleveland 5, Ohio, or use the Request Card at page 18. Circle No. 86.

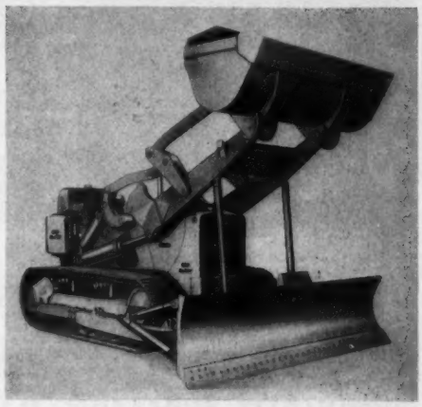
Use of a bulldozer arrangement permits wider application of the No. 977 Series E Traxcavator.

Bulldozer now available for tractor-excavator

The No. 977A angling bulldozer is now available for the No. 977 Series E Traxcavator, the Caterpillar Tractor Co. announces.

Changes have been made on the C-frame and trunnion groups so that the same bulldozer arrangement can be used on either the Series E or Series D machines.

For further information write to the Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the Request Card at page 18. Circle No. 33.



MOBILE OFFICE Units are low in cost . . . Built to your specifications . . . There's a unit to fill your every need.

Because MOBILE OFFICE Units are easy to move from job to job, they enable you to have office, engineering, paymaster and other facilities at every point of your operation.

These units are economical, time saving, rugged and durable. They are self-containing, and are available with air-conditioning, and can be fitted to your specifications.

MOBILE OFFICES are being used by major contractors and other major businesses throughout the United States. Standard units may be rented, leased or purchased.

Remember, whatever your needs may be, a MOBILE OFFICE Unit can be built to fill your requirements.

If It's Mobile . . . We Build It!

MOBILE OFFICE, INC.
Phones; DOrchester 3-1048-9

7314 Stony Island Avenue, Chicago 49, Illinois

For more facts, circle No. 367

Slurry-Seal Spreader

Gives **best,** uniform **results** with this **NEW Method** of surface sealing . . . thin, even application of asphalt-sand-water slurry. **Fills** and **seals** cracks. **Levels** minor depressions. **Skid-proofs** surfaces.

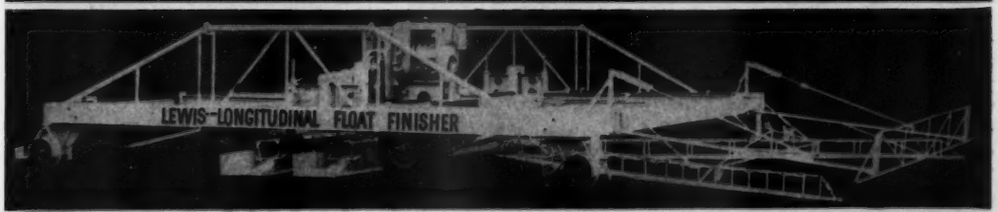
NEW TARCO Spreader made of bolted metal construction, forms light, yet rugged box. Two **slurry-leveling blades:** one semi-rigid; one flexible rubber adjusts to pavement contour by 5 screw-type rods. Completely equipped: heavy **drag chains,** 2 retractable **traveling wheels;** water **sprinkler;** telescoping **tow bar;** operator's **cat walk.**

For more spreader details—or more information on NEW Slurry-Seal Method see your TARCO dealer or write to us.

TARRANT MFG. COMPANY
31 Jumel Place, Saratoga Springs, N. Y.

For more facts, circle No. 368

...The only major change in cement concrete side form finishing equipment in over 20 years!



THE LEWIS, TWIN SCREED LONGITUDINAL FLOAT FINISHER

offers exclusive features guaranteeing a better job at less cost.

1. Oscillating twin screeds suspended effecting a 25-foot straight edge.
2. Additional 23-foot V-float producing 19-foot straight edge.
3. Self contained vibrators in screeds.
4. Mechanical shoveling device for proper material distribution in front of screed.

Says a Project Manager for one of the world's largest construction firms: "We are pleased to tell you that our production was upped 30% with approximately 11% less labor, and all the while we were meeting the rigid Corps of Engineers specifications of ¼-inch in 16-feet, with no noticeable excess effort on our part."

Write for new eight-page brochure on the LEWIS PAVING TEAM, and the following lines of Lewis designated equipment:

1. Levelling Attachment
2. Sub Grader
3. Mechanical Curing Machine
4. Multiple-Blade Concrete Saw
5. Dual-Blade Concrete Saws
6. Pavement Surface Grinder
7. Lewis Stake Driver

Name upon request

Dealer inquiries invited • Write, phone or wire for complete details

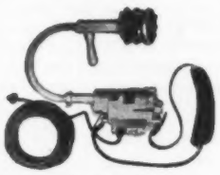
CONCRETE MACHINERY LIMITED
9530 EAST RUSH STREET EL MONTE, CALIFORNIA
Phones: CUmberland 3-5505 • CUmberland 3-4839 • Gilbert 4-0690

For more facts, use Request Card at page 18 and circle No. 369

"BERG"
CONCRETE
SURFACERS

for: bridges, highways, airport runways, dams, culvert, floors, walls.

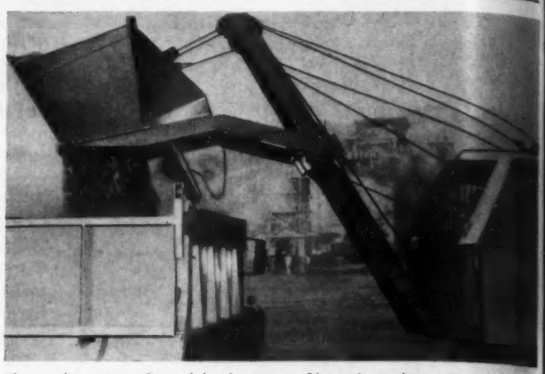
Model H-8 and H-10 (above). Gasoline powered unit especially designed for surfacing concrete highways, runways, streets, floors. Includes exclusive power take-off for attaching "BERG" flexible shaft surfacing equipment. Model A (right) is lightweight, electric powered unit that suspends from operator's shoulder. Equipped with interchangeable heads and attachments for surfacing bridges, buildings, dams, culvert, walls or similar surfaces. Wire or write for details.



CONCRETE SURFACING MACHINERY CO.
4665 Spring Grove Avenue Cincinnati 32, Ohio

For more facts, use Request Card at page 18 and circle No. 372

Product Parade



Shown here is a 2-yard bucket on a ¾-yard machine. The attachment weighs 3,800 pounds and is said to work easily without additional counterweight. The unit is also available in larger sizes.

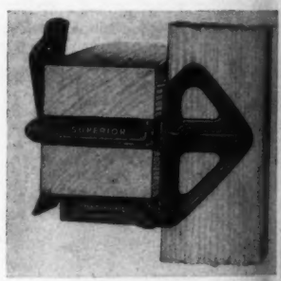
New cable shovel loader for ¾-yard machines

A new all-cable shovel loader requiring no special hydraulic equipment is announced by M. P. McCaffrey, Inc. The unit loads, swings, and dumps without travel.

According to the manufacturer, the versatile loader can be adapted to fit any ¾-yard or similar crawler or pneumatic-tire machine. Installation is said to be accomplished easily without changes to the basic machine or use of a crowd mechanism.

For further information write to M. P. McCaffrey, Inc., Dept. C&E, 2121 E. 25th St., Los Angeles 58, Calif., or use the Request Card at page 18 Circle No. 41.

New wale bracket for wooden forms



A wale bracket said to eliminate the potential hazard of toe-nailed wales separating from the studs is available from Superior Concrete Accessories, Inc.

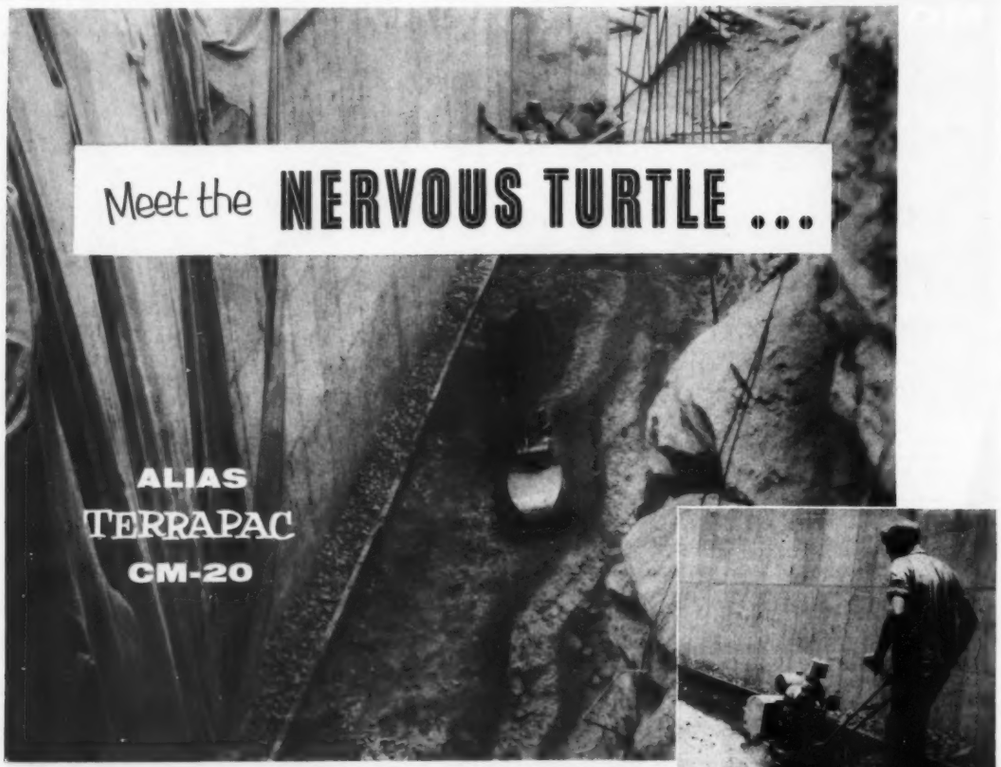
Made of heavy malleable casting, the bracket holds two 2×4 wales. It is applied independently of wall ties and clamps and may be fastened on either side of the stud with 3 nails.

For further information write to the Superior Concrete Accessories, Inc., Dept. C&E, 9301 King St., Franklin Park, Ill., or use the Request Card at page 18. Circle No. 48.

Announce power buggy with 10-foot capacity

The Aeroil Production Co., Inc., announces the Model PL-10 power buggy.

The bucket has a capacity of 1[illegible] cubic feet and reportedly will travel at a maximum speed of 5 mph up a 20 per cent slope with a 1,500-pound



Work in the most confined areas at less cost than old-fashioned tamping methods.

the Latest Development in
VIBRATORY SOIL COMPACTORS

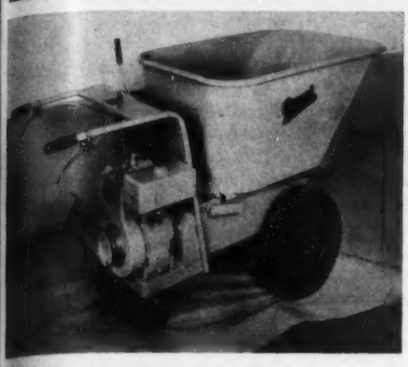
Down South they wouldn't know what a CM-20 is, but ask about the Nervous Turtle and you get an earful . . . It's the only heavy-duty, one-man operated compactor on the market - develops a 6,600 lb. compaction wallop at speeds up to 75 feet a minute . . . Handles not only granular materials but many clay mixtures as well . . . Maneuvers close to abutments, retaining walls and piling; ideal for backfill jobs and shoulder work, railroad embankments, floors and foundations . . . The CM-20 penetrates up to 30 inches or more - in one or two passes, while its smaller version, the CM-15, will compact lifts up to 12 inches . . . Ask your local Terrapac distributor to demonstrate the model that is best suited to meet all of your varied job requirements. Call him today - you'll be ahead. 41-78

NO COMPARABLE MACHINES ON THE MARKET TODAY!

VIBRO-PLUS PRODUCTS, Inc.
STANHOPE, NEW JERSEY

WORLD'S LEADING MANUFACTURER OF VIBRATORY EQUIPMENT FOR OVER TWO DECADES.

For more facts, use Request Card at page 18 and circle No. 371



payload. The clutch and brake are operated from one hand lever; throttle control from another. Forward and reverse gears are operated by a foot pedal.

The buggy weighs 560 pounds and is 31 inches wide, 37 inches high, and 75 inches long.

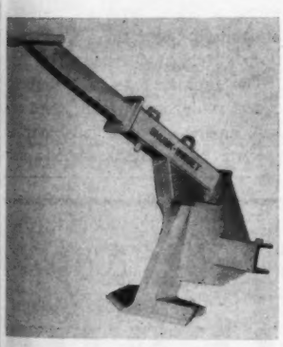
A flat pallet is available in place of the bucket for bricks, etc.

For further information write to the Aeroil Products Co., Inc., Dept. C&E, 17 Wesley St., South Hackensack, N. J., or use the Request Card at page 18. Circle No. 42.

New crawler-tractor tool simplifies tree removal

A crawler-tractor tool that speeds and simplifies tree removal is available from the Shunk Mfg. Co.

Called the Shunk-Winget land-clearing tree plow, this unit is offered in several models for box-clamp attachment to the C-frame of any crawler tractor having sufficient



power for this work. Mounting and dismounting are said to take less than 5 minutes. A second type can be attached to the push-arms of a bulldozer and is interchangeable with the dozer blade.

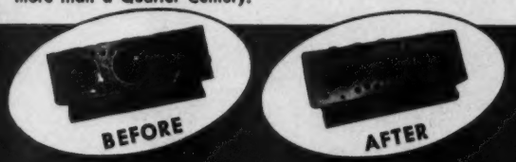
The tree plow consists of a rugged box-construction-type boom that telescopes from 6 feet to 8 feet 6 inches, plus a plow with horizontal and vertical cutting blades. It combines cutting and leverage action to remove trees in one operation.

Depth of penetration varies according to the type and size of tractor used; on larger units, the plow severs roots as deep as 2 or more feet below the surface, the manufacturer reports.

For further information write to the Shunk Mfg. Co., Dept. C&E, Bucyrus, Ohio, or use the Request Card at page 18. Circle No. 39.

DON'T THROW AWAY CRACKED DIESEL CYLINDER HEADS

You can save 50% of replacement cost with Factory Rebuilt Swick-Guth Heads. Swick-Guth restores cracked or worn heads, blocks, transmission cases to a Guaranteed good as new condition by the Controlled Heat Process . . . successfully used for more than a Quarter Century.



Send today for price list and a free booklet on the famous Swick-Guth Process and the name of the dealer nearest you

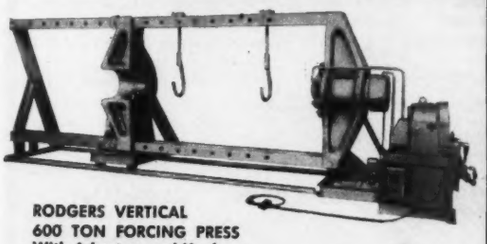
SWICK-GUTH CO.
McPHERSON, KANSAS • FORMERLY GUTH CO.
"SPECIALISTS IN WELDING DIESEL CASTINGS"

For more facts, use Request Card at page 18 and circle No. 370

THE MOST FOR YOUR MONEY!...

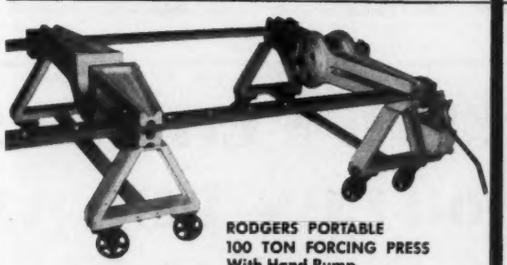
Rodgers Forcing Presses

Greater Versatility — Rugged Power — Flexible Controls

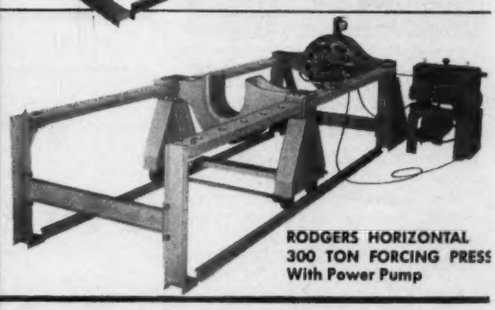


RODGERS VERTICAL
600 TON FORCING PRESS
With Adaptors and Hooks

RODGERS INCLINED
400 TON FORCING PRESS
With Power Pump



RODGERS PORTABLE
100 TON FORCING PRESS
With Hand Pump



RODGERS HORIZONTAL
300 TON FORCING PRESS
With Power Pump

When you buy a Rodgers Forcing Press, you are not tying up your money in a single purpose tool. Compared with other presses, Rodgers design permits a wider variety of jobs to be handled—from the full tonnage capacity of the press, on heavy duty work, to partial capacities required for light jobs.

Rodgers Press design also offers unique flexibility in the interchangeability of cylinders and power source. Each press can be easily modified to suit changing job requirements. And an "extra" feature is the simple way the cylinder and pump may be detached for jacking, pulling and pressing work in the shop or field. Rodgers positive, accurate controls may be used at the press or remote.

When you check Rodgers Forcing Presses, feature for feature, their rugged construction, fast, positive action, and the variety of adaptors, hooks and other accessories available, you will be convinced that a Rodgers will give you the *most* for your money.

Rodgers Forcing Presses are available in standard, horizontal, vertical, inclined and portable models . . . capacities from 100 to 600 tons . . . with power or hand pumps.

Write for Catalog No. 315A . . . it gives complete details and specifications.

HYDRAULICS Rodgers RULES THE WORLD BOYER

RODGERS HYDRAULIC, Inc.

Pioneers In High Pressure Hydraulics Since 1932

7415 Walker St. • Minneapolis 16, Minn.

For more facts, use Request Card at page 18 and circle No. 373

All movements of the new Maxon Dumpcrete are hydraulically powered and controlled by the operator standing at the control panel at the center of the machine.

Offer concrete spreader in two new models

The new Maxon Dumpcrete concrete spreader is available in two different models to fit single-lane and full-width paving requirements.

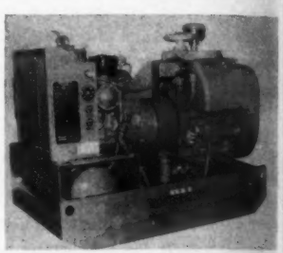
Single-lane paving models will lay a slab up to 16 feet in width, with adjustment in 6-inch increments from 11 to 16 feet. Full-width models are adjustable in increments of 6 inches for paving widths from 20 to 26 feet. Length of slab (length of bucket) remains 12 feet for both models.

These new units are designed to work with Dumpcrete hauling bodies for paving by the central mixing-nonagitated hauling method. Capacity is figured on a placing rate of 180 to 260 cubic yards per hour, and is based on a 1.5-minute cycle allowing 60 seconds for loading, 15 seconds for placing, and 15 seconds for movement and strike-off.

Three basic operations for the Dumpcrete concrete spreader are: (1) load, (2) spread, and (3) move screed. The spreader bucket can be loaded from either side and has a capacity of 5½ cubic yards. It can be made to move transversely or vertically, to tilt, or to open and close.

For further information write to the Maxon Construction Co., Inc., Manufacturing Division, Dept. C&E, 2600 Far Hills Ave., Dayton 19, Ohio, or use the Request Card at page 18. Circle No. 119.

Offer new version of rotary compressor



A modified version of its 125-foot rotary power-takeoff compressor, featuring a chain drive and clutch, is announced by the Worthington Corp.'s Holyoke Division.

The unit includes a 2-stage oil-cooled rotary compressor, speed control, engine governor, oil cooler, air receiver, oil separator, and oil storage

IT TOOK A
17 TON PULL
TO BREAK THIS
FLEXCO®
CONVEYOR BELT SPLICE

(Full details on this Test available on request)

...more than 3 TIMES the stress placed on most operational belts

Tests such as this, using belts of various sizes and construction, are part of Flexible's continual effort to improve fastener design and performance.

FLEXCO — THE PREFERRED FASTENER BY BELT MAINTENANCE CREWS! Holding power . . .ease of application . . . wearability, thoroughly tested before they ever reach the user.

QUALITY FEATURES OF THE FLEXCO DESIGN . . .

Cutaway showing the compression plates, teeth and precision-made bolts and nuts.

FOR SPLICING, REPAIRING RIPS AND TEARS . . . ON NEW and WORN BELTS!

ORDER FROM YOUR DISTRIBUTOR, OR WRITE TO:

Flexible
STEEL LACING COMPANY

4608 Lexington St. Chicago 44, Ill.

For more facts, circle No. 374

Why 90% of All Sod is cut with Ryan Sod Cutters

● Producing *uniform* sod with perfect dimensions is a major reason why 90% of all commercial sodding contractors have standardized on RYAN Sod Cutters.

But there are other vital reasons, too:

HIGH PRODUCTION. Up to 12,000 square yards of perfect sod cut per day.
AUTOMATIC CUT-OFF. Cuts sod in 1 ft. to 9 ft. lengths automatically.
TWO-SPEED TRANSMISSION. Provides greater efficiency for various sod cutting conditions.
FINGER TIP CONTROLS. Easy to operate: do not get out of adjustment.

RYAN Sod Cutters are precision engineered, built to withstand rugged operation with little, if any, maintenance. Sold and serviced nationally. Write for name of nearest dealer.

Ryan LANDSCAPING EQUIPMENT Company
871 Edgerton Street • St. Paul 1, Minnesota

For more facts, use Request Card at page 18 and circle No. 375

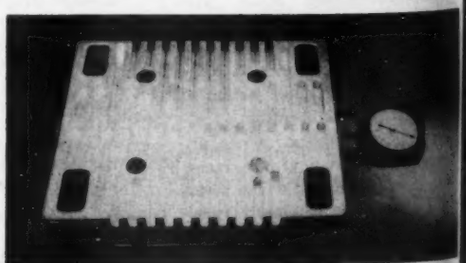
WEIGH VEHICLES UP TO 140,000 LBS. PER AXLE WITH HEAVY DUTY "M-1" LOADOMETER

NEW — PORTABLE — ACCURATE — SELF CONTAINED — DURABLE SCALE

The RIGHT Answer To The Heavy Duty Weighing Problem For Off Highway Vehicles On EARTH WORK AND MATERIAL HAULING.

Capacity 70,000 lbs.
30,000 kilos

Specifications on request



LOADOMETER CORPORATION, BALTIMORE 11, MD.

For more facts, use Request Card at page 18 and circle No. 376

receiver all mounted on a common base plate.

Completely controlled from the cab by the driver, the compressor is belt-driven through a split power takeoff.

For further information write to the Worthington Corp., Dept. C&E, 37 Appleton St., Holyoke, Mass., or use the Request Card at page 18. Circle No. 63.

Coating prevents sticking of concrete to forms

ConCreLese, a newly developed coating to prevent the sticking of concrete to all types of forms, and also to act as a preservative for the forms, is announced by The Thomas Co.

Easily applied by spraying, brushing, or rolling on the form, it dries quickly and leaves a non-oily, thin coating that absorbs upon the surface of the form and chemically resists the sticking of concrete.

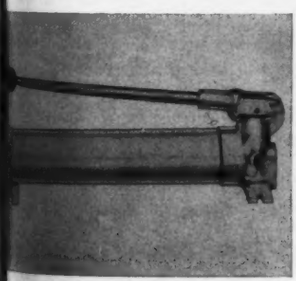
According to the manufacturer, ConCreLese cannot stain the surface of the concrete, and there is no migration of oil into the concrete to soften the surface, thus lessening the chance of spalling. If desired, the surface of the concrete may be painted after the coating is used.

For further information write to The Thomas Co., Dept. C&E, 1645 Hennepin Ave., Minneapolis 3, Minn., or use the Request Card at page 18. Circle No. 137.

Hydraulic hand pump furnishes 10,000 psi

A manually operated 2-speed hydraulic pump, which changes speed and pressure automatically, is announced by the Owatonna Tool Co.

Designed to perform common pulling jobs, the pump provides a maxi-

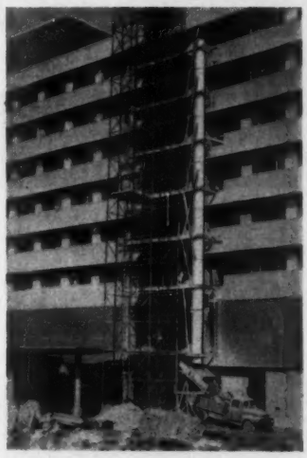


mum pressure of 10,000 psi at the start of the pull; after the gear, wheel, or bearing is broken loose, speed increases and pressure drops automatically. A fingertip control valve assures instant release or pumping action.

This 28½-pound dual-piston pump has an oil capacity of 140 cubic inches and will operate all of OTC's Power Twin center-hole hydraulic rams. The outlet is a ⅜-inch female pipe thread hose.

For further information write to the Owatonna Tool Co., Dept. C&E, 311 N. Cedar St., Owatonna, Minn., or use the Request Card at page 18. Circle No. 40.

A circular metal chute for the disposal of construction refuse from upper stories during construction of a building is available from Wilkinson Chutes, Inc. Consisting of large round telescoping metal tubes, the chutes have large intake openings adjustable to any floor height. As the building progresses, the chute is extended and intakes are added to handle the disposal of rubbish from each floor. After the job is finished, the chute is easily disassembled and transferred to a new job for re-use. For further information write to **Wilkinson Chutes, Inc.**, Dept. C&E, 619 E. Tallmadge Ave., Akron 10, Ohio, or use the Request Card at page 18. Circle No. 103.



Steel Replaces Wood in Mountain Pipe Line. More than thirty years ago, the Pennsylvania Power & Light Company built a wood-stave conduit in the Pocono Mountains. Now the old conduit, which ran from Lake Wallenpaupack to a hydroelectric plant 3½ miles away, has been wholly replaced by an all-steel pipe line. Final "can" section of the new steel line is shown being lowered into position.

The big "can" is 38 ft 6 in. long and has a diameter of 14 ft 1 in. Together with its temporary saddles, it weighs approximately 20 tons. Handling this and similar heavy loads was a job for Bethlehem wire rope—always a dependable performer. Bethlehem slings were also used in the rigging, so that every lift could be made with complete assurance.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem Wire Rope.

BETHLEHEM STEEL

BETHLEHEM STEEL — BETHLEHEM WIRE ROPE

For more facts, use Request Card at page 18 and circle No. 377

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card that is bound in at page 18 of this issue.

YES! YOU CAN BUY DIRECT
SEND US YOUR ORDERS FOR
NEW ROTARY SWEEPER BROOM CORES

WE MANUFACTURE ALL SIZES

SUGGESTION—To faraway users. Order cores only without fibres but ready to fill.

• Detroit Harvester • Fordson • Grace (3 types) • Hough • Huber • Lull • Littleford • Little Giant • Melfi-Blumberg (M-B) • Bosco • Spearswell • Tampo And many others

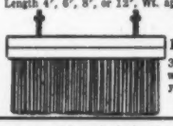
$69.50 UP.

Also Cores Made to Your Specifications

KENNEDY'S
VAN BRUSH MFG. CO. INC.
SINCE 1928
2748 McGee Trfwy Kansas City, Mo

Road Builders — it's sensational!
BIG PECKERWOOD BIG
C-O-N-T-I-N-U-O-U-S
Drag Broom Levelers with Spring Steel Wires or Bass Fibres six inches wide and lengths to 12 feet, and also now three inches wide. No frame required.

Also furnished filled with Palmyra-Hickory or Bass Fibres or even Spring Steel Wires.
WE SHIP WORLDWIDE—IMMEDIATELY
In stock — ONLY $3.50 FOOT
Length 4', 6', 8', or 12', Wt. approx. 5½ lb. (foot)



THE LITTLE PECKERWOOD
3" wide, 15" long, with two bolts, fits your present frame.
ONLY $2.50 EACH

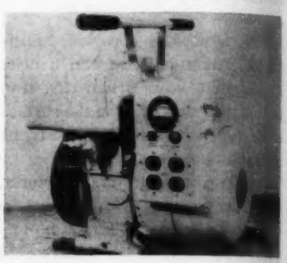
For more facts, use Request Card at page 18 and circle No. 378

Two new electric plants added to generator line

Pacific Mercury has added two new electric plants, Models 3500AS and 4500AS, 120-volt single-phase, to its line of generators.

Designed specifically for construction use, these plants can utilize their entire capacity from one outlet, or it can be distributed among the four outlets with which the units are equipped.

Recommended for the operation of concrete vibrators, radial saws, and other similar equipment, the new models come fully equipped. Standard features include a built-in rpm meter with a red-and-green color indicator



to simplify governor adjustment and insure full power output.

For further information write to Pacific Mercury, Dept. C&E, 14062 Burbank Blvd., Van Nuys, Calif., or use the Request Card at page 18. Circle No. 20.

Wherever You Are
Spicer
Is There With
The Right PTO

When time is important . . . think of Spicer. Even if you're on site, your Spicer distributor is as close as the nearest telephone.

Across the nation, your Spicer distributor carries a complete line of all types of PTOs for quick replacement, plus all the joints and shafts you need for a complete auxiliary power installation. Ask your distributor about the Spicer line, or write Dana Corporation, Toledo 1, Ohio.

DANA CORPORATION • Toledo 1, Ohio
DANA PRODUCTS Serve Many Fields:

AUTOMOTIVE: Transmissions, Universal Joints, Propeller Shafts, Axles, Power-Lok Differentials, Torque Converters, Gear Boxes, Power Take-Offs, Power Take-Off Joints, Clutches, Frames, Forgings, Stampings.

INDUSTRIAL VEHICLES AND EQUIPMENT: Transmissions, Universal Joints, Propeller Shafts, Axles, Gear Boxes, Clutches, Forgings, Stampings.

AVIATION: Universal Joints, Propeller Shafts, Axles, Gears, Forgings, Stampings.

RAILROAD: Transmissions, Universal Joints, Propeller Shafts, Generator Drives, Rail Car Drives, Pressed Steel Parts, Traction Motor Drives, Forgings, Stampings.

AGRICULTURE: Universal Joints, Propeller Shafts, Axles, Power Take-Offs, Power Take-Off Joints, Clutches, Forgings, Stampings.

MARINE: Universal Joints, Propeller Shafts Gear Boxes, Forgings, Stampings.

Many of these products manufactured in Canada by Hayes Steel Products Limited, Merritton, Ontario.

DANA Spicer

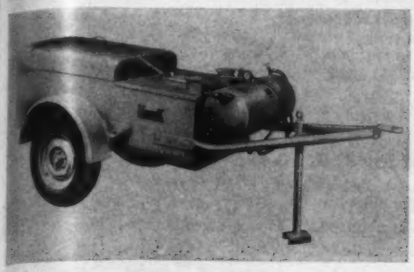
For more facts, use Request Card at page 18 and circle No. 379

Portable voice system covers up to 2 acres

Porta-Chief, a new transistor-powered, fully self-contained and portable voice system, with 20 watts output and wide-angle coverage of up to 2 acres, is offered by the Audio Equipment Co., Inc.

The amplifier uses four power-transistors, and runs on four standard 6-volt dry batteries. The user speaks into a hand microphone, equipped with fingertip switch, on an 8-foot (or longer) cable. Over-all weight is 16 pounds, and the amplifier and batteries are housed in a watertight case.

For further information write to the Audio Equipment Co., Inc., Dept. C&E, 75 Harbor Road, Port Washington, N. Y., or use the Request Card at page 18. Circle No. 100.



Materials-melting kettle melts faster, more safely

The Hauck Mfg. Co. offers the E-Z-Loader kettle, Series KT, for melting tar, asphalt, pitch, and bituminous compounds.

The E-Z-Loader's stressed-skin design, and the internal-tube heating system are said to result in a kettle that is lower loading for easier charging. It melts faster and more safely without overheating and is easier to maintain, according to the manufacturer.

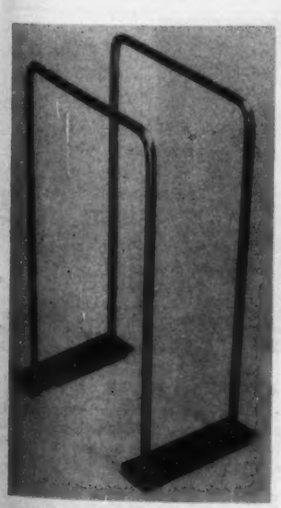
LP-gas and kerosene-burning models are available. Trailer-type kettles on pneumatic tires are offered in 60, 90, 120, 180, 240, and 360-gallon melting capacities. Skid-type kettles are made in 60, 90, and 120-gallon capacities.

For further information write to the Hauck Mfg. Co., Dept. C&E, 126 Tenth St., Brooklyn, N. Y., or use the Request Card that is bound in at page 18. Circle No. 13.

Offer wire beam saddle of stirrup-type design

A new stirrup-type wire beam saddle for forming bridge decks or any concrete slabs over structural-steel beams is announced by the Universal Form Clamp Co.

Designed to provide positive bearing for ledgers or joists, the beam saddle eliminates variations in deck



elevations due to "biting" of wire into edges of the lumber. The saddles are fabricated in various sizes to meet job specifications.

For further information write to the Universal Form Clamp Co., Dept. C&E, 1238 N. Kostner, Chicago 51, Ill., or use the Request Card at page 18. Circle No. 57.

Announce new Tournapull featuring 360 horsepower

A new 360-hp Model B Tournapull is announced by the LeTourneau-Westinghouse Co. A new transmission is also offered for this machine.

The engine is a GM diesel turbocharged 6-cylinder 2-cycle diesel. Designated Model GM 6-110T, it is available in combination with either the special Allison torque-converter transmission or the newly offered step gear transmission.

The B Pullpak scraper remains at its capacity of 21 cubic yards struck, and 28 cubic yards heaped. It is readily interchangeable with other trailing units designed for use behind the prime mover.

For further information write to the LeTourneau-Westinghouse Co., Dept. C&E, 2301 N. Adams St., Peoria, Ill., or use the Request Card at page 18. Circle No. 109.

IT WAS LAID AT 102 FPM
on a Morrison-Knudsen job in Wyoming

Ask the Morrison-Knudsen crew about the mat they laid on U.S. 30 near Wamsutter, Wyoming. *Outstanding* is the word for it . . . perfect in uniformity, density and smoothness.

While you're at it, ask them about the over-all performance of the Cedarapids Paver that laid this perfect mat at laydown speeds up to 102 feet per minute. Once again, the word is *outstanding!*

And that's the word you'll find all over the country describing the Cedarapids Bituminous Paver. No need to make a trip to Wyoming! Just ask Cedarapids Paver owners in your State (your Dealer will give you their names) about the speed, mat perfection, and inspector-acceptance this advanced-design Cedarapids machine will bring to your job.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.

Cedarapids Built by IOWA **BITUMINOUS PAVERS**

GIVE YOU ALL THESE OTHER BENEFITS, TOO

- **High capacity**— Paver easily handles 200 tons per hour—keeps your hot-mix plant going full blast.
- **Maximum density**— 3600 screed vibrations per minute assure maximum density at any paving speed. Rapid vibration "irons" the mat into uniform textured, smooth, dense surface, without tears or voids.
- **Automatic material-depth control**— prevents voids—relieves operator from constant attention to depth of material in front of screed
- **Less maintenance required**— efficient electrical controls and drives eliminate many troublesome wearing parts.
- **Easiest operation**— Simple finger-tip controls on one panel—no confusing, fatiguing forest of levers and pedals—operator can concentrate on laying perfect mat!
- **Unique crawler action** and oscillating track rollers permit paving over obstructions—manhole covers and uneven spots in the grade—with screed maintaining a level plane.

For more facts, use Request Card at page 18 and circle No. 380

The ease with which the hoist cylinder is attached to the body speeds installation as well as detachment for any servicing required in the field.

New telescopic hoist for 8, 9, 10-foot bodies

A new front-end telescopic hoist for 8, 9, and 10-foot bodies is announced by the Marion Metal Products Co.

A major feature of this hoist is the ease with which the cylinder is attached to the body. This method of attachment not only speeds up installation but also allows fast, easy detachment for any servicing of the hoist in the field, the manufacturer states.

Other benefits and features include a weight saving of from 65 to 90 pounds; Marion's standard-duty pump with a safety relief valve; and fast dumping speed. The hoists mount in their own subframes to provide a rugged, sturdy unit.

For further information write to the Marion Metal Products Co., Dept. C&E, P. O. Box 406, Marion, Ohio, or use the card at page 18. Circle No. 112.

For more facts on these products, circle the indicated number on the Request Card at page 18.

SWENSON SPREADERS *Speed Sealcoating!*

Spreads Salt or Chloride for DUST CONTROL or SOIL STABILIZATION

write for complete information

SWENSON SPREADER & MFG. CO.

Lindenwood, Illinois

For more facts, use Request Card at page 18 and circle No. 381

New ripper boot for heavy-duty rock rippers

A new "wing-foot" boot attachment for Ateco heavy-duty rock rippers is available from the American Tractor Equipment Co.

Designed for use with all Ateco forged 24-inch straight ripper shanks, the boot produces greater lifting and fracturing action in shale, sedimentary rock, paving, and similar materials. According to the manufacturer, it not only speeds up the ripping operation, but also shatters material more completely for easy scraper loading. It can be installed or removed without taking the shank off the ripper swing bracket.

For further information write to the American Tractor Equipment Corp., Dept. C&E, 9131 San Leandro Blvd., Oakland 3, Calif., or use the card at page 18. Circle No. 132.

Big Ripper Tackles Tough Rock Jobs

Designed to use full power of IH TD15, TD18, TD20 or TD24

The tremendous power of the IH TD15, TD20 or TD24, plus the 10,000-pound Greenville tractor-mounted rock ripper, shatters rock and packed earth for easy scraper loading. On many jobs explosives, shovels and trucks are eliminated. Put this power-packed team to work for you. Your IH dealer can give you the facts. Let him show you how you can save as much as 25% on any earth or rock moving job.

LIVE SWIVEL ACTION
Shanks swivel 15° in either direction . . . follow tractor like a trailer. Points have live action that shatters rock like a jack hammer.

RUGGED POWERFUL SHANKS
Scientific contour gives extra strength at strain points and pulls points down deep . . . rocks roll out and clear of headframe. Made of tough, heat-treated, manganese-moly steel. Mount one, two or three shanks as needed.

POSITIVE CONTROL
Double-acting hydraulic system provides fingertip control and puts full tractor weight on points for fast, deep penetration.

DRAWBAR TAKES PULL
The ATECO drawbar replaces the tractor drawbar and drawbar brackets. Clevis is accessible with ripper installed.

RIP AT ANY DEPTH
Easily adjusted to permit settings as deep as 24". Points are always at most desirable angle for best penetration and splitting action. Points are easily replaced.

WRITE FOR Greenville Bulletin IH-658. It gives complete data on the Greenville-Ateco ripper.

See it at your International-Harvester Dealer's

GREENVILLE
STEEL CAR COMPANY
ATECO DIVISION
Greenville, Pennsylvania

For more facts, use Request Card at page 18 and circle No. 382

Jackson FIBER GLASS HATS and CAPS surpass all Federal tests for construction workers' safety hats. In eight standard colors, others in quantities.

COMBINATIONS of Safety Caps available with welding helmets, goggles, face shields.

The 'TOP HAT' for Safety . . . Jackson's 'LIFE GUARD' offers unequaled protection by surpassing Federal Specifications for construction workers' and Edison Institute tests as well. A HAT and a CAP in white, yellow, and gray.

Jackson 'ALUMIHAT' and 'ALUMICAP' comply with Federal Specifications except electrical resistance. Both a satin finished aluminum.

tops

• TOPS IN COMFORT

To men who wear safety hats all day long, comfort is important. Jackson hats and caps fit well and bear smoothly and evenly on the head.

See how little it takes to fit the headband to clearly marked hat sizes. And, being easy to fit, men will fit these hats accurately, so they stay on better in windy weather. Chin straps and winter-liners are also available.

The polyethylene headband is smooth and flexible, yet firm enough to hold its shape. A soft-backed leatherette sweatband fits all around.

• TOPS IN STYLE

They protect without looking bulky and have a well designed, uncluttered look. Easy to clean, they keep their shiny, smooth finish.

• TOPS IN SAFETY

Thorough comparative testing against published industry-accepted standards proved that Jackson's three types of safety hats, each in its own class, offer an extra margin of safety. They should be your choice.

Jackson Products

31739 Mound Road, Warren, Michigan
Sold through Welding Supply and Safety Dealers

For more facts, use Request Card at page 18 and circle No. 383

Welder/power plants with electric starters

Miller Electric's AEA series gasoline-engine-driven welder/power plants are now offered with optional electric starters. The new system is powered by a 12-volt battery with Bendix-drive automotive-type starter.

The Onan 12.9-hp engine and other components that combine to deliver 225 amp ac for welding on a 10 per cent duty cycle remain unchanged.

The new models are designated AEA-200-E and AEA-200-LE.

For further information write to the Miller Electric Mfg. Co., Inc., Dept. C&E, 718 S. Bounds St., Appleton, Wis., or use the Request Card at page 18. Circle No. 110.

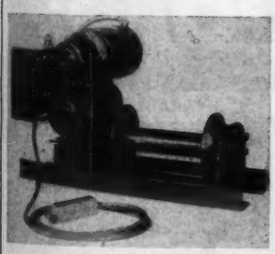
Waterproofing admixture for masonry products

Arid-Mix, a waterproofing admixture for use in the mixing of any masonry product containing portland cement, is offered by the American Sta-Dri Co.

The result is said to be maximum cohesion of cement to the aggregate to form a dense, hard concrete.

For further information write to the American Sta-Dri Co., Dept. C&E, Brentwood, Md., or use the Request Card at page 18. Circle No. 138.

The Most Versatile Electric Power Winch or Hoist You Can Buy!



"My-Te" All-Purpose Winch

A new portable all-purpose winch powered by car or truck battery lifts 2500 pounds and pulls 5000 pounds. The My-Te All-Purpose Winch works off any 6 or 12 volt battery. It is considerably less expensive than a winch with power take-off, and offers the additional advantage of portability.

Other features include stress-proof shafts and gear ratio of 175 to 1, completely sealed gear housings, constant pressure brake when free spooling cable, and 10-ft. remote control cable with forward and reverse action.

List price is $237.50

Dealers' Inquiries Invited

CITY ENGINEERING CO., INC.
Dept. C&E
3547 Mass. Ave. • Indianapolis 18, Ind.

For more facts, circle No. 384

New vibration inducer is high-amplitude unit

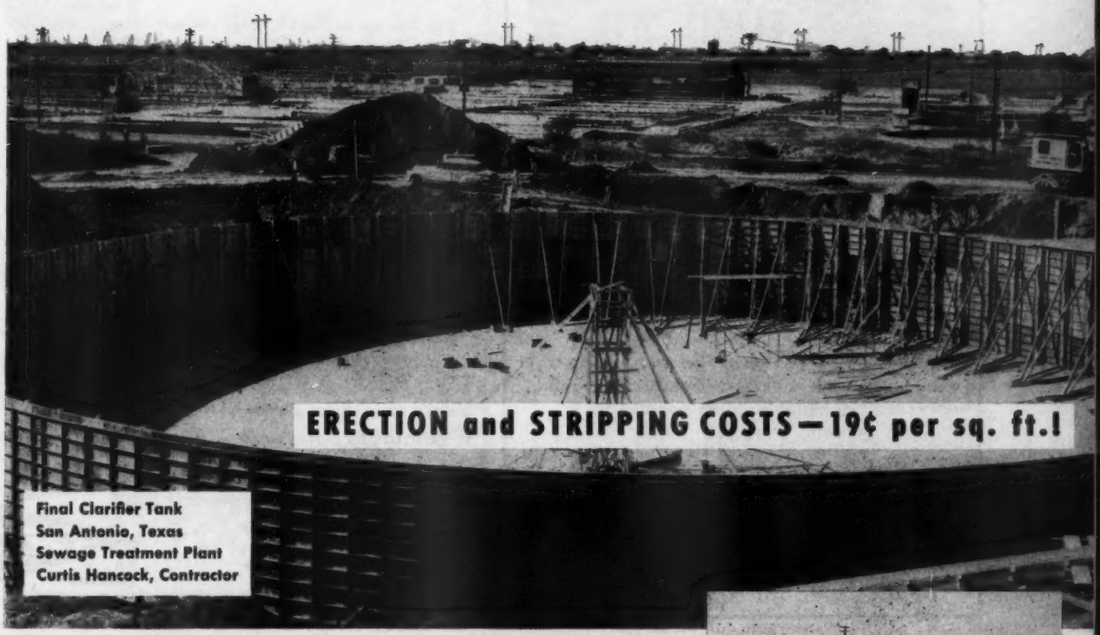
A new high-amplitude vibration inducer, which starts and keeps materials moving during the unloading of railroad cars or hoppers, is announced by the Martin Engineering Co.

Called Vibrolator CCVP, this unit is portable with its own mounting clamp and can be mounted in any position or angle convenient to the job. Pneumatically driven, it starts and operates with minimum air at any angle. It is shockproof and sparkproof.

According to the manufacturer, the CCVP can be precisely controlled at any vibration frequency from a few cycles to more than 60 cycles per second.

For further information write to the Martin Engineering Co., Dept. C&E, Neponset, Ill., or use the Request Card at page 18. Circle No. 113.

contractor FORMS 130 ft. DIAMETER TANK 13 ft. HIGH IN 9 HOURS!



Final Clarifier Tank
San Antonio, Texas
Sewage Treatment Plant
Curtis Hancock, Contractor

When a contractor can erect, align, and brace the forms for a 130 ft. diameter, 13 ft. high tank in *a single 9 hour day* — that's speed! And when *total costs* for erecting and stripping are only 19c per sq. ft. — that's economy!

This is the record of pre-fabricated UNI-FORM Concrete Panels used by Curtis Hancock in forming a final clarifier tank for the new 12 million dollar San Antonio, Texas sewage treatment plant expansion program.

In addition to UNI-FORMING the circular clarifier tank, Hancock used UNI-FORM panels to form four 30 ft. x 300 ft. aeration tanks, and a 1300 ft. concrete by-pass tunnel — approximately 135,000 sq. ft. of contact area in all.

In comparing the performance of UNI-FORM Panels on this job to a similar one done previously with forms he had built himself, Mr. Hancock estimates that he has saved at least four days in time alone!

It's performance like this that sells contractors and engineers on UNI-FORM panels. No other method of concrete forming can give you faster ground-to-ground forming speed, efficiency, flexibility, and economy. Why not investigate the advantages this modern concrete forming system can bring to you? Our strategically located Branch Offices and Distributors are ready to demonstrate and prove the advantages of UNI-FORM Panels to you. *Write for the new UNI-FORM Panel Catalog today.*

UNI-FORMED walls are clean, require little or no finishing.

UNIVERSAL FORM CLAMP CO.
1238 N. KOSTNER • CHICAGO 51, ILLINOIS

CONCRETE FORM SPECIALISTS SINCE 1912

BRANCH OFFICES AND WAREHOUSES
SAN LEANDRO, CAL. 2051-9 Williams Street
HOUSTON, TEX. 2314 Preston Ave.
BALTIMORE, MD. 1020 N. Kresson St.
LOS ANGELES, CAL. 13210 S. Figueroa St.
CLEVELAND, OHIO 24901 Lakeland Blvd.
ATLANTA, GEORGIA 1401 Howell Mill Rd., N.W.
Universal Form Clamp Co. of Canada, Ltd., 226 Norseman St., Toronto, Ontario

For more facts, use Request Card at page 18 and circle No. 385

Fully oscillating multiple king pins reduce inward movement of the front wheels to a minimum.

Pneumatic-tire roller is self-propelled unit

Galion announces a new 9-wheel 12-ton self-propelled rubber-tire roller for base and finish surface compaction. The unit has 4 drive-compacting wheels and 5 steering-compacting wheels. The front and rear wheel treads overlap. The overall design of this new roller is said to provide complete visibility for operating close to curbs and buildings.

The manufacturer points out that with its unitized assembly each tire, wheel, and wheel brake is serviceable individually; the completely enclosed drive chains are easily accessible and serviceable individually; and the entire power train can be removed as a unit.

The machine features a maximum weight of 8,000 pounds and a weight of 24,500 pounds when fully ballasted.

Power is supplied by an IHC-UE328 gasoline engine rated at 80 horsepower. A 4-speed syncro-mesh transmission provides 4 speeds forward and 4 reverse.

For further information write to The Galion Iron Works & Mfg. Co., Dept. C&E, Galion, Ohio, or use the card at page 18. Circle No. 125.

REDUCE JOB COSTS . . .
ELIMINATE HAND LABOR

AGRIHOE cuts job costs by eliminating the need for hand labor in trenching, digging, backfilling or rough grading operations.

Basic tractor also available with dozer blade, front end loader & scarifier

Valuable Distributorships Open

AGRICAT EQUIPMENT CO.

5353 Lancaster Ave., Phila. 31, Pa. • TRinity 7-3835

For more facts, circle No. 386

Voice range to half mile with new power megaphone

The Falcon Alarm Co., Inc., offers a transistorized power megaphone called the Falcon Chief.

According to the company, the unit gives up to 6,000 2-second amplified messages from a standard replaceable battery.

It is lightweight (3¼ pounds) and is easy to handle and use.

For further information write to the Falcon Alarm Co., Inc., Dept. C&E, 243 Broad St., Summit, N. J., or use the Request Card at page 18. Circle No. 114.

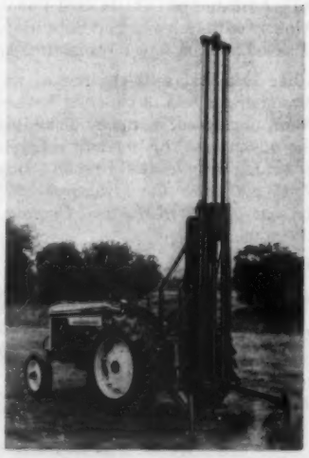
Vertical auger drill is semihydraulic unit

J. R. Prewitt & Sons, Inc., announces a semihydraulic vertical auger drill said to allow one man to do the job it would ordinarily take a crew of men to do.

Featuring a power-takeoff drive, it utilizes the full weight of the rear of the tractor to force the auger into the ground.

Augers are available in various sizes from 3 to 20 inches in diameter and will drill to a depth of 60 feet.

For further information write to J. R. Prewitt & Sons, Inc., Dept. EC, Dept. C&E, Pleasant Hills, Mo., or use the Request Card at page 18. Circle No. 15.



MODEL 3½ST
3½ cu. ft. tilting drum; is a standard ½ bag contractor's machine.

MODEL 6S-CRT
Gilson's one bag mixer with power loader

MODEL 16S
Has a three bag capacity with a 7'4" wide skip.

MODEL 11S-CRT
Gilson's two bag mixer is a sturdy frame heavy duty mixer

Gilson machines are backed with 47 years of manufacturing experience. Machines are all Timken Bearing equipped.

Write for Price Lists and other Free Catalogues.

Gilson

EST. 1911
Brothers Co.
FREDONIA, WISCONSIN

Also Garden Equip., Shredders — Tillers — Mowers

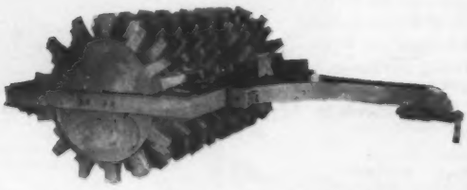
Choice Dealerships still available.

For more facts, circle No. 388

For economical compaction!

GRACE ROLLERS

• 11-ton Self Propelled Pneumatic.
• Trailer Pneumatics from 9 to 60 tons.



• Sheepfoot Rollers from 250 to 750 psi. Hardened foot ends on small rollers at no extra cost.

W. E. GRACE MANUFACTURING CO.
6003 S. Lamar • Dallas 15, Texas • HA 1-7147

For more facts, circle No. 387

FUNK revers-O-matic DRIVES

HYDRAULIC CONTROLLED REVERSING CLUTCH with TORQUE CONVERTER

For Instant Movement of Loads FORWARD and REVERSE or LIFT and LOWER

Other Funk Products

Funk Standard Power Take-Off

Funk Gear Reduction

FUNK REVERS-O-MATIC DRIVES are years ahead in engineering. A single throttle lever moved forward or reverse engages hydraulically actuated clutch and instantly changes your speed and direction of travel. No direct connection between power and load to stall your engine. The torque multiplies power smoothly, reducing maintenance.

Investigate FUNK REVERS-O-MATIC DRIVES now. Our engineers will be glad to adapt or design equipment for your specific needs.

FUNK MFG. CO.
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COFFEYVILLE, KANSAS

For more facts, circle No. 389

Design changes on the Chester Model 6060 tamping roller include flat-cone feet, wedge-spade cleaner bars, and a short-turn frame.

Tamping roller features several design changes

The completely redesigned Model 6060 tamping roller is announced by Chester Products, Inc.

Cone-type feet of forged steel have been adopted to prevent scuffing or dragging compacted lifts. Ends of the feet are flat, with a bearing surface of 7 square inches per foot to achieve maximum compactive effort. Optional wedge, round, or sheep-type feet are available.

Other features include wedge-spade cleaner bars and a short-turn frame. "Live-action" oscillation for compaction of lift edges or depressions is provided by the two drum frames linked together with a heavy-duty hinge-pin assembly.

For further information write to Chester Products, Inc., Dept. C&E, Belle Ave. and B & O R.R., Hamilton, Ohio, or use the Request Card at page 18. Circle No. 120.

New paving breaker has improved design

A new air-powered paving breaker, the Thor No. 125, that features greater power, heavier tappet, thicker tappet flange, and full air cushioning even when the tool is running free, is offered by the Thor Power Tool Co.

Other features include an airtight operating valve, reversible long-life piston, automatic oiling system with reservoir, swivel hose connection, 4-bolt air-cooled back head, and rubber grips.

The unit has an over-all length of 29½ inches and weighs 85 pounds.

For further information write to the Thor Power Tool Co., Dept. C&E, 175 N. State St., Aurora, Ill., or use the Request Card at page 18. Circle No. 37.

Line of automotive jacks for shop, road service

A complete line of Simplex automotive jacks for shop and road service on trucks is announced by Templeton, Kenly & Co.

Included in the line are four models of hydraulic service jacks in capacities of 1¼, 1½, 2, and 4 tons. Also available is a 1½-ton-capacity hydraulic hand jack with a 7-inch height and a lift of 5¼ inches, as well as three models of adjustable stands with capacities of 2, 5, and 7 tons and maximum heights of 17¾, 25, and 29½ inches, respectively.

For further information write to the Templeton, Kenly & Co., Dept. C&E, 16th St. and Gardner Road, Broadview, Ill., or use the Request Card at page 18. Circle No. 111.

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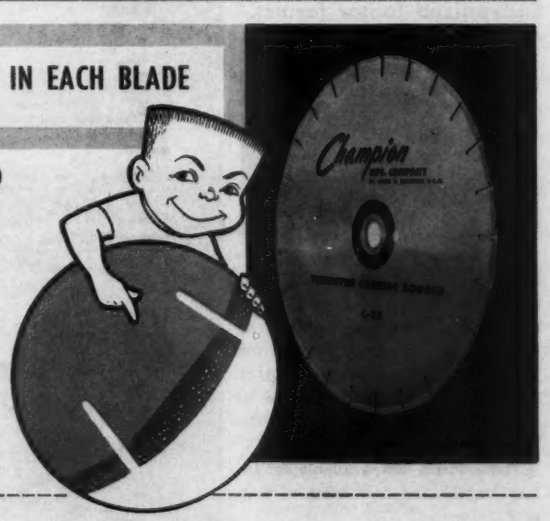
with *Champion's* new
TUNGSTEN CARBIDE BONDED
DIAMOND BLADES
featuring the exclusive
FLAT BOTTOM SEGMENT



The flat bottom segments on these new Champion blades permit each segment to be more securely soldered to the blade's core.

Since all diamonds are in the upper ⅔ of the segments, you get full use of all diamonds in the blades, while retaining width of cut.

Tungsten Carbide, the hardest of man made metals, holds the diamonds in place far longer, adding still more to your blade life.

Available in a complete range of specifications for cutting all aggregates and ages of concrete.

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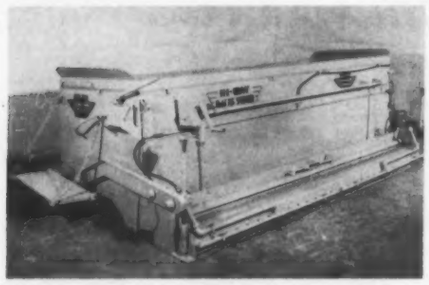
Please send complete information on Champion Tungsten Carbide Bonded Diamond Blades for concrete sawing and name of my nearest Champion dealer.

Name.....
Address.....
City..... State.....

For more facts, use coupon or Request Card at page 18 and circle No. 391



Much of the hand labor necessary in preparing a base course reportedly is eliminated by a completely adjustable full-floating screed, which permits concave or convex surfaces up to a 1½-inch crown.

New bituminous spreader in 8, 9, 10-foot widths

The Highway Equipment Co.'s Model AS bituminous spreader, available in 8, 9, and 10-foot widths, with capacities up to 1⅓ cubic yards, is said to be an ideal running mate for most self-propelled equipment. Its size permits paving anywhere a truck can drive.

A completely adjustable, full-floating screed which permits concave surfaces up to a 1½-inch crown eliminates much of the hand labor necessary to prepare a base course. A hydraulic shut-off gate prevents dribbling of material, and eliminates emptying the paver at the end of a pass.

The unit can be equipped with an optional heated screed to pave both hot and cold mixes. Specifications include built-in ballast boxes, folding-type operator's platforms on both sides of the paver, and a self-coupling hitch for quick hook-ups to any truck.

For further information write to the Highway Equipment Co., Dept. H20-3, Dept. C&E, 616 D Ave., N. W., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 124.

Galvanized footer forms feature ease of handling

The Quaker State Metals Co. announces new lightweight metal concrete forms that are easy to handle and set up. They are supported by ½-inch reinforcing rods, driven through the holes in the flanges. They can be bent into curves by snipping the flanges between the holes.

These forms are available in 10-foot lengths and in heights of 4, 6, or 8 inches.

For further information write to the Quaker State Metals Co., Dept. C&E, Lancaster, Pa., or use the Request Card that is bound in at page 18. Circle No. 71.

For more facts on these products, circle the indicated number on the Request Card at page 18.

For more facts, circle No. 392→

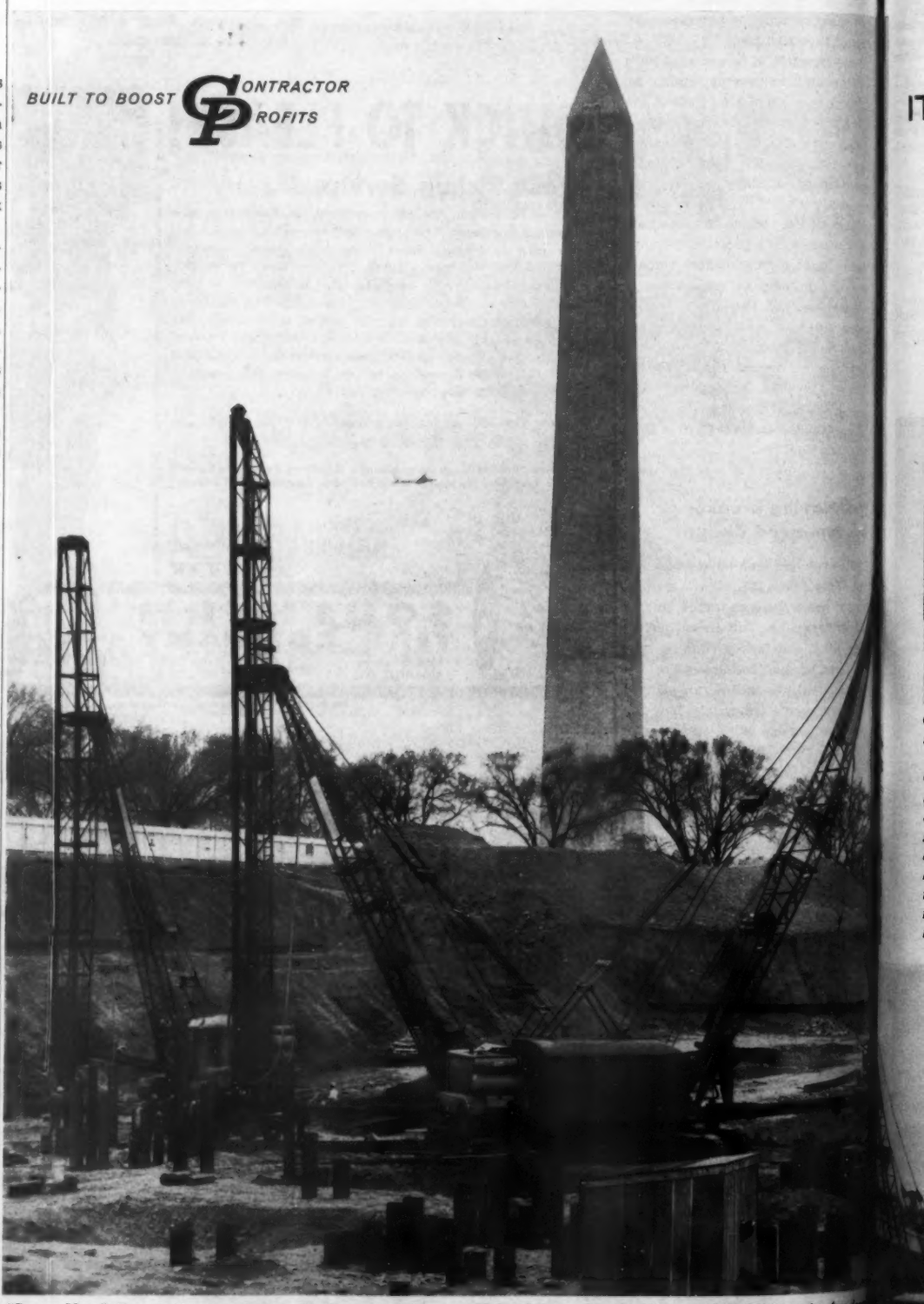
Two new graders added to earthmover line

Austin-Western announces two new all-wheel-drive-and-steer power graders, the Pacer-200 and the Super-200. The former is a 4-wheel machine, the latter a 6-wheel model. Both machines have a basic weight of 20,000 pounds.

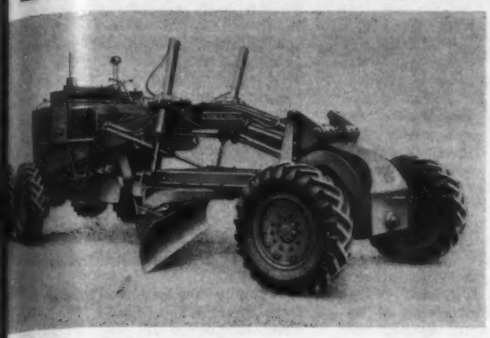
Front and rear power steering and full hydraulic control are standard. The units are equipped with GMC 106-hp diesel engines, and power-train options permit a choice of dry clutch or torque converter and either 4-speed or 6-speed transmissions. A hydraulically operated power-tilt moldboard is an optional feature.

For further information write to Austin-Western, Baldwin-Lima-Hamilton Corp., Dept. C&E, 601 N. Farnsworth Ave., Aurora, Ill., or use the card that is bound in at page 18. Circle No. 78.

BUILT TO BOOST CONTRACTOR PROFITS



"Power Vane" Rotary Compressors supply air-operated hammers on each of the three pile-driving rigs shown here. On this job, 2800 piles are being driven in "tough ground" to a depth of 53 feet below subgrade. You can't beat CP Rotaries for dependable performance when air demand is heavy. Capacities 210, 365, 600 and 900 c.f.m.



◀The Super-200 power grader.

Conveyor loader handles up to 1 yard per second

High production loading, up to 1 cubic yard of dirt per second, reportedly is possible with the new Ko-Cal 60-inch Pitloader. The unit can also be used for loading trucks with gravel, rock, and sand.

The line also includes 36 and 42-inch models, with the model size determined by the width of the conveyor belt that carries the bulldozed material to the hauling units.

Job installation of the Pitloader is said to be quickly and easily handled. Heavy construction allows skidding without dismantling when short work area changes are made. The 36 and 42-inch models, mounted on rubber tires, can be made ready for travel to new locations within minutes.

Engine choice for power for all three Pitloader models is optional, but minimum power requirements are 60, 80, and 150 horsepower, respectively, for the 36, 42, and 60-inch models.

For further information write to the Koehring California Co., division of Koehring Co., Dept. C&E, 2200 Country Club Blvd., Stockton 4, Calif., or use the Request Card that is bound in at page 18 of this issue. Circle No. 105.

Mobile vertical file for sheets 5½ feet long

The Plan Hold Corp.'s rolling-stand vertical file has been redesigned so that the height can be adjusted for filing sheets of any length up to 66 inches.

When equipped with Plan Hold brackets and binders, the rolling stand accommodates up to 1,200 large sheets. It is only 24 inches wide.

Another unit, the double rolling stand, provides vertical filing for up to 2,400 sheets with a maximum length of 36 inches.

For further information write to the Plan Hold Corp., Dept. C&E, 5204 Chakemco St., South Gate, Calif., or use the Request Card at page 18. Circle No. 140.

For further information on any product described in this section, circle the indicated number on the Request Card at page 18.

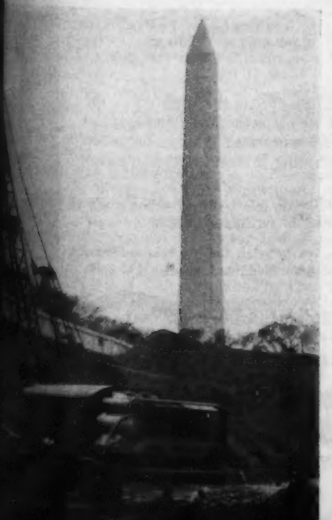
IT TAKES EQUIPMENT WITH **POWER** AND **STAMINA** TO SAFEGUARD THE PROFIT ON TIGHT SCHEDULES

Whether the job is supplying air for pile-driving operations in balky material, drilling hundreds of blast holes through splintery shale, or bolting structural steel at breathtaking heights . . . you will find CP equipment has the muscle and the stamina to handle your toughest schedules. Helps you pick up the profits too – because it will stay on the job 24 hours a day under the severest conditions. That's why we say "Built to Boost Contractor Profits." Have your CP equipment distributor give you more complete information, or write for Catalog 600-8. Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.

CP Torque Control Impact Wrenches like this tighten thousands of high strength bolts to exact tightness.

Bolting gangs like the 15-1/2" length and 23-lb. weight that help crews hold top speed on tight schedules.

CP self-propelled Tracdrils working in rugged rock formations like this cut costs by easily hauling own air supply up 10% grades when necessary . . . move quickly from hole to hole. Simple, positive hydraulic controls make one-man operation practical. A time-saving piece of equipment in rough going.



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For more facts, circle No. 393

Product LITERATURE

To obtain free copies of any of the literature described in the following section, circle the designated number on the Request Card at page 18.

Electric hammers, drills—an illustrated leaflet on Syntron's completely self-contained electromagnetic electric hammers and self-rotating electric hammer drills for cutting, chipping, and drilling concrete and masonry. Gives complete descriptions and specifications.

Write to the Syntron Co., Dept. C&E, 227 Lexington Ave., Homer City, Pa., or use the Request Card at page 18. Circle No. 22.

Rotary pumps—a bulletin on the Deming line of heavy-duty internal-gear rotary pumps. Contains typical application data, specifications, operating-conditions table, and an installation diagram. Bulletin No. 1550.

Write to The Deming Co., Dept. C&E, Salem, Ohio, or use the Request Card at page 18. Circle No. 131.

Self-contained vehicle scale—an illustrated fact sheet on the Model M-1 heavy-duty Loadometer, a portable, completely self-contained vehicle scale offering a 70,000-pound capacity per wheel without bridging. Specifications.

Write to the Loadometer Corp., Dept. C&E, 1503 W. 41st St., Baltimore 11, Md., or use the Request Card at page 18. Circle No. 139.

Adjustable-speed drives—a bulletin describing the operation and application of American Pulley wide-range, adjustable-diameter, Wedge-belt sheaves. Lists all installation and mounting dimensions for both adjustable-diameter and companion sheaves. Briefly discusses auxiliary equipment.

Write to The American Pulley Co., Dept. C&E, 9200 Wissahickon Ave., Philadelphia 29, Pa., or use the Request Card at page 18. Circle No. 133.

Materials - truck unloader—a brochure listing the benefits of the Side-O-Matic boom-type unloader for tandem-axle trucks and semitrailers, designed especially for makers and haulers of concrete blocks. Illustrated with cutaway drawing and on-the-job photographs. Specifications and truck chassis requirements included.

Write to the Side-O-Matic Unloader Corp., Dept. C&E, P. O. Box 1561, York, Pa., or use the Request Card at page 18. Circle No. 61.

Scraper—a folder on the Euclid Model S-18 21-cubic-yard-struck-capacity scraper. Well illustrated with a cutaway and exploded views of major components, with special emphasis on operation, servicing, and the power train consisting of 4-speed Torqmatic drive with converter lock-up. Form 511.

Write to the Euclid Division, General Motors Corp., Dept. C&E, 1361 Chardon Road, Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 54.

Shaft mucker—literature describing the Cryderman shaft mucker designed for both vertical and incline shafts, and for both digging and loading. One-man operation is stressed.

Write to Machinery Center, Inc., Dept. C&E, 1201 S. Sixth West, Salt Lake City, Utah, or use the Request Card at page 18. Circle No. 134.

Aluminum bridge railings—a folder containing complete drawings and specifications on Reynolds aluminum bridge railings and accessories. Contains 26 separate drawings printed on tracing paper for convenience.

Write to the Reynolds Metals Co., Dept. C&E, Dept. PRD-5, P. O. Box 2346, Richmond 18, Va., or use the Request Card at page 18. Circle No. 135.

Forms for prestressed concrete—a booklet describing and illustrating Watco steel forms for precast prestressed concrete. Covers forms for square piling, octagonal piling, single-tee joists, bridge members, double-tees, and others.

Write to the Plant City Steel Corp., Dept. C&E, P. O. Box 1308, Plant City, Fla., or use the Request Card at page 18. Circle No. 14.

Earth augers—a catalog detailing the design and operating characteristics of Pengo earth augers, boring heads, drill heads, as well as parts and accessories. Text generously illustrated with photographs. General Catalog A-1.

Write to the Petersen Engineering Co., Inc., Dept. C&E, P. O. Box 398A, Santa Clara, Calif., or use the Request Card at page 18. Circle No. 74.

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The vertical pump drive arrangement, pioneered by Hartford Machine Screw Company, is a revolutionary and exclusive ROOSA MASTER feature. The vertical adaptability has saved manufacturers thousands of tooling expense dollars by permitting standardization of engine blocks for gasoline and diesel engines.
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SAVE HOURS
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In any construction race, the Power-cart accelerates faster . . . dumps faster . . . turns in smaller radius . . . and can be reversed at top speed.
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THE WORLD'S MOST COMPLETE LINE
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Motor grader—a specification sheet on the Allis-Chalmers Model 45 motor grader, a unit weighing approximately 23,800 pounds, and powered by a 127-hp diesel engine. Text well illustrated with a large cutaway drawing; specifications included.

Write to the Construction Machinery Division, Allis-Chalmers Mfg. Co., Dept. C&E, Milwaukee, Wis., or use the Request Card at page 18. Circle No. 90.

Welding materials, practice—a pocket-size catalog of the full Arcos line of stainless, low-alloy, nonferrous rods and electrodes for manual, automatic, and semiautomatic welding. Also contains a section on technical guidance for successful welding performance. Well illustrated with charts, photographs, and drawings.

Write to the Arcos Corp., Dept. C&E, 1500 S. 50th St., Philadelphia 43, Pa., or use the Request Card at page 18. Circle No. 3.

Transit mixer—a brochure listing the benefits of the S & M Agitor, a versatile transit mixer offered in 4, 6½, and 8-cubic-yard sizes. Illustrated with on-the-job photographs and closeups of major components.

Write to the S & M Mfg. Co., Inc., Dept. C&E, 2901 W. Mill Road, Milwaukee 9, Wis., or use the Request Card at page 18. Circle No. 11.

Ripping tool—an illustrated folder listing the features of the Double J wedge-action breaker, a ripping tool available for all popular tractor-mounted hydraulic rippers. Specifications included.

Write to the Double J Breaker Co., Inc., Dept. C&E, 3484 E. Gage Ave., Bell, Calif., or use the Request Card at page 18. Circle No. 50.

Electric blasting—the 60-page Atlas "Handbook of Electric Blasting." In simple language, it covers such subjects as the advantages of electric blasting over old methods, the nature and construction of an electric blasting cap, and the sources of power for electric blasting. Text well illustrated with photographs, drawings, tables, and graphs.

Write to the Explosives Division, Atlas Powder Co., Dept. HR, Dept. C&E, Concord Pike and New Murphy Road, Wilmington 99, Del., or use the Request Card at page 18. Circle No. 35.

Crushers—a bulletin describing Symons intermediate cone crushers for second and third-stage reduction crushing. Contains a schematic cross section of a 30-inch crusher; discusses the advantages of controlled feed and even distribution; and offers a table giving average capacities at various settings and feed openings. Bulletin No. 236A.

Write to the Nordberg Mfg. Co., Dept. C&E, 3073 S. Chase Ave., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 31.

Concrete-joint curing tape—a bulletin describing Presstite ConSeal, a sealant designed to cure sawed or formed concrete joints and also to keep the joints clean until they are sealed. Application data included.

Write to the Presstite-Keystone Engineering Products Co., Division of American-Marietta Co., Dept. C&E, 39th and Chouteau Aves., St. Louis, Mo., or use the Request Card at page 18. Circle No. 25.

To obtain the literature described on this page, write to the manufacturer or circle the designated number on the Request Card at page 18.

Concrete accessories—a folder describing the Symons line of safety shores with a maximum load capacity of 6,000 pounds, as well as column clamps and steel stakes. Illustrated with drawings, photographs of typical installations. Gives specifications.

Write to the Symons Clamp & Mfg. Co., Dept. C&E, 4249 Diversey Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 89.

Wire-rope fittings—a well illustrated catalog of Newco wire-rope fittings, including combination wire-rope clamp and thimble safety hooks, choker hooks, bridles, slip-on thimbles, load protectors, open and closed thimbles, pipe hooks, and pipe bridles. Charted data on dimensions and weights.

Write to the Newco Mfg. Co., Dept. C&E, 3636 Main St., Kansas City 11, Mo., or use the Request Card at page 18. Circle No. 92.

Surveying instruments—literature on Askania surveying instruments. Describes and illustrates Type Tu 1-second theodolite; Types Tt and Tk tacheometer theodolites; Type Na automatic engineer's level; and Types Ni and Nik engineer's level with coincidence level.

Write to Askania-Werke A. G., U. S. Branch Office, Dept. C&E, 4913 Cordell Ave., Bethesda, Md., or use

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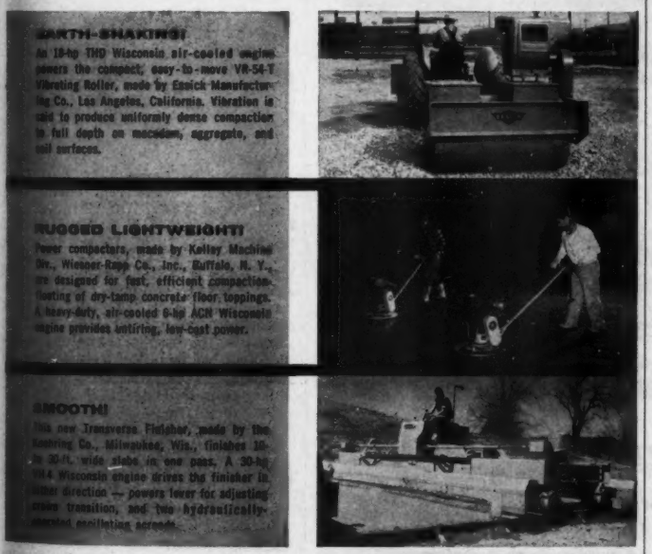
EARTH-SHAKING!
An 18-hp THD Wisconsin air-cooled engine powers the compact, easy-to-move VR-54-T Vibrating Roller, made by Ensick Manufacturing Co., Los Angeles, California. Vibration is said to produce uniformly dense compaction to full depth on macadam, aggregate, and soil surfaces.
RUGGED LIGHTWEIGHT!
Power compactors, made by Kelley Machine Div., Wiesner-Rapp Co., Inc., Buffalo, N. Y., are designed for fast, efficient compaction. Tooting of dry-tamp concrete floor toppings. A heavy-duty, air-cooled 6-hp AGH Wisconsin engine provides untiring, low-cost power.
SMOOTH!
This new Transverse Finisher, made by the Kenteng Co., Milwaukee, Wis., finishes 18-in. 30-ft. wide slabs in one pass. A 30-hp VH-4 Wisconsin engine drives the finisher in either direction — powers lever for adjusting screed transition, and two hydraulically-operated oscillating screeds.

You pay for workhours — not manhours — when you use Wisconsin-powered equipment on your construction jobs. That's because Wisconsin engines minimize power shutdowns — keep men and machines busy around the clock, regardless of weather.

Wisconsin engines outwork and outlast other engines of their type and size. They start fast — deliver steady load-lugging power that shrugs off the effects of sudden shock loads.

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Leading builders include Wisconsin heavy-duty, air-cooled engines on their mechanized equipment by choice — not by chance. For the many dollars-and-sense benefits, specify Wisconsin engines on the equipment you buy. Sizes from 3 to 56 hp. Write for Bulletin S-237.

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CALWELD DRILLS

CALWELD, INC., 7222 E. Slauson Ave., Los Angeles 22, California

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the Request Card at page 18. Circle No. 79.

Welding positioners—a booklet on P&H welding positioners. Illustrates and describes nine heavy-duty models, ranging from 3,000 to 100,000-pound capacity. Details many new features and accessories said to provide greater range, precision, and convenience in weldment handling.

Write to the Harnischfeger Corp., Dept. C&E, 4400 W. National Ave., Milwaukee 46, Wis., or use the Request Card at page 18. Circle No. 99.

Masonry anchors—a catalog covering the complete Diamond Expansion Bolt Co. line of masonry anchors. Covers Diamond-P-Lag screw expansion shields; Keystone machine-bolt expansion shields; Multi-size wood-screw anchors; D H D hammer-drive anchors (nail type); Di-Forge percussion-type masonry drills; Diamide carbide-tipped masonry drills; and Wing-Ding wall-screw anchors. Catalog No. 158.

Write to the Diamond Expansion Bolt Co., Inc., Dept. C&E, 500 North Ave., Garwood, N. J., or use the Request Card at page 18. Circle No. 51.

Pocket-size penetrometer—literature describing Soiltest's direct-reading pocket-size penetrometer for classification of soils. Includes data on operation and a list of typical uses.

Write to Soiltest, Inc., Dept. C&E, 4711 W. North Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 75.

Road construction, maintenance equipment—an informative booklet on Seaman-Gunnison machines for road construction and maintenance. Includes illustrated descriptions of the firm's Duo-Pactors and Tri-Pactors; utility scrapers; bituminous distributors; and Hydro-Jet flushers. Brief specifications for all units shown.

Write to the Seaman-Gunnison Corp., Dept. C&E, 2763 S. 27th St., Milwaukee 15, Wis., or use the Request Card at page 18. Circle No. 76.

To obtain the literature described on this page, write to the manufacturer or circle the designated number on the Request Card at page 18.

Plans file—a booklet describing how engineering drawings, tracings, prints, or maps can be stored in quantities from 1 to 30 in each 2½-inch-square Hamilton-Pack interlock file. Illustrates various filing arrangements, gives installation instructions, and shows how interlock files can be combined wth existing drawer files for maximum flexibility.

Write to the Drafting Equipment Division, Hamilton Mfg. Co., Dept. C&E, 18th and Jefferson, Two Rivers, Wis., or use the Request Card at page 18. Circle No. 77.

Pile shells—a bulletin on Armco Hel-Cor pile shells. Covers such subjects as speed of installation, strength, and economy; also illustrates steps in mandrel-driving. Photos of typical installations; tabular data. Bulletin PS-14258.

Write to Armco Drainage & Metal Products, Inc., Dept. C&E, 703 Curtis St., Middletown, Ohio, or use the Request Card at page 18. Circle No. 52.

Truck crane—a catalog on the Manitowoc Model 2900 truck crane. The unit has a 60-ton capacity and, according to the manufacturer, can be converted in minutes to clamshell or dragline. Illustrations, specifications.

Write to the Manitowoc Engineering Corp., Dept. C&E, 16th and River Sts., Manitowoc, Wis., or use the Request Card at page 18. Circle No. 18.

Highway guardrail—a folder describing Anderson Safeway steel-beam highway guardrail. Contains curving data in chart form; dimensional line drawings; photographs of typical installations.

Write to the Anderson Tank & Mfg. Co., Dept. C&E, 2626 Dort Highway, Flint, Mich., or use the Request Card at page 18. Circle No. 72.

In-line submersible pumps—an illustrated bulletin describing Layne horizontal in-line submersible pumps for booster service, their applications and uses. Bulletin No. 203.

Write to Layne & Bowler, Inc., Dept. AD, Dept. C&E, 1993 Chelsea Ave., Memphis 8, Tenn., or use the Request Card at page 18. Circle No. 68.

Excavator—a folder describing the Gradall Model G-1000, which features a continuous 360-degree swing and a digging depth of 27 feet with boom extensions. Shows the machine at work on a variety of jobs and pictures it as both truck and crawler-mounted.

Write to The Warner & Swasey Co., Construction Equipment Division, Dept. C&E, 5701 Carnegie Ave., Cleveland, Ohio, or use the Request Card at page 18. Circle No. 73.

Hydraulic crane scale—illustrated literature describing design improvements on the Martin-Decker Sensater hydraulic crane scale. Describes the new SU-5 series, which is available in capacities of 1,000 to 4,000 pounds. Bulletin M-25.

Write to the Martin-Decker Corp., Dept. C&E, 3431 Cherry Ave., Long Beach 7, Calif., or use the Request Card at page 18. Circle No. 5.

Metal buildings—literature on all-steel, self-supporting Wonder Building structures. Describes and illustrates three basic designs: straight-wall, semicircular wall, and "truss-skin" roof system. Stresses the double corrugated design of individual panels.

Write to the Wonder Building Corp. of America, Dept. C&E, 30 N. LaSalle St., Chicago 2, Ill., or use the Request Card at page 18. Circle No. 129.

Vibrating screens—a folder describing a new method of estimating vibrating-screen area requirements. Using deck location, material shape and weight factors, and screen dimensions in the basic mathematical formula, the method is described in 7 steps, supplemented with appropriate charts. Includes a sample problem and solution.

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Dept. C&E, 2213 W. Mission Road, Alhambra, Calif., or use the Request Card that is bound in at page 18. Circle No. 30.

Truck-mounted crane—literature on the Teale Model 400 fully hydraulic truck-mounted crane. Offers on-the-job photographs, as well as helpful drawings and specifications.

Write to Teale & Co., Dept. C&E, P. O. Box 308, Omaha 1, Nebr., or use the Request Card at page 18. Circle No. 88.

Small all-purpose roller—a fact sheet on the Schertzer Model 3000 all-purpose roller (2,000 pounds empty, 3,000 pounds with ballast). Photographs and specifications.

Write to the Schertzer Sales Corp., Roller Division, Dept. C&E, 32 Prospect St., Somerville 43, Mass., or use the Request Card at page 18. Circle No. 85.

Trench drills—a bulletin giving complete operating specifications, dimensions, and recommended uses for the Salem line of trench drills. Presents three models for handling augers up to 6 feet long and 24 inches in diameter. Photographs and line drawings. Bulletin TD-159.

Write to The Salem Tool Co., Dept. C&E, 769 S. Ellsworth Ave., Salem, Ohio, or use the Request Card at page 18. Circle No. 24.

Portable pumps—a fact sheet describing Midland Models 5M and 7M portable self-priming centrifugal pumps. Specifications and a performance chart for both units. Illustrated with photographs.

Write to the Midland Pump Division, Midland Products Co., Dept. C&E, 181 Greenwood Ave., Midland Park, N. J., or use the Request Card at page 18. Circle No. 66.

Equipment haulers—a specification sheet on Totem-All flat-bed equipment-hauling units. Covers the single-axle Model 23FS, tandem-axle Model 46FS-OW, and triple-axle Model 68FS. Illustrated with photographs and dimensional drawings.

Write to the Totem-All Division, Birmingham Mfg. Co., Inc., Dept. C&E, P. O. Box 2805, Birmingham, Ala., or use the Request Card at page 18. Circle No. 65.

Air motor jacks—a brochure on Joyce-Cridland Yello-Jackit air motor jacks, with construction applications illustrated and described. Data on all models in the line—20, 35, 50, and 100-ton capacities—in a performance chart, accompanied by photographs and cutaway drawings. Bulletin No. 435-IJ.

Write to The Joyce-Cridland Co., Dept. C&E, 2027 E. First St., Dayton 3, Ohio, or use the Request Card at page 18. Circle No. 95.

Forms for concrete—a catalog on interior and exterior applications of Masonite Presdwood concrete forms in the construction of beams, girders, slabs, walls, columns, foundations, and arches. Illustrated with installation photos and drawings of typical concrete forms. Includes a description of the special hardboard used in forming flat or curved surfaces of reinforced or massed concrete, plus a table of properties.

Write to the Masonite Corp., Dept. C&E, 111 W. Washington St., Chicago 2, Ill., or use the Request Card at page 18. Circle No. 47.

Material-handling equipment—an illustrated, loose-leaf-type catalog covering Bushman jib cranes, gantry cranes, grabs, buckets, and coil upenders.

Write to the H. L. Bushman Co., Inc., Dept. C&E, 100 W. Central Ave., Roselle, Ill., or use the Request Card at page 18. Circle No. 69.

Telescopic shoring—a brochure on Pecco interchangeable, telescoping horizontal shoring. Illustrations include on-the-job photographs, drawings, and a loading table giving full details for allowable spacing in relation to span and slab thickness.

Write to the American Pecco Corp., Dept. C&E, Federal Savings Bldg., 188 E. Post Road, White Plains, N. Y., or use the Request Card at page 18. Circle No. 16.

Backhoes—a catalog describing the Hopto backhoe Models 500 TM, 200 SPR, and 200 SPC, plus the complete line of attachments for all Hopto backhoes. Generously illustrated with drawings and on-the-job photographs.

Write to the Badger Division, The Warner & Swasey Co., Dept. C&E, 1124 W. Fifth St., Winona, Minn., or use the Request Card at page 18. Circle No. 8.

Washing, screening plant—a bulletin describing the Cedarapids Wash-All Junior portable washing and screening plant. A flow diagram shows how this 50 to 100-tph plant can wash sand and gravel and classify it into three sizes, plus oversize.

Write to the Iowa Mfg. Co., Dept. C&E, 916 16th St. N. E., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 91.

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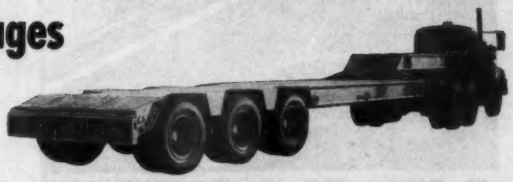

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Lifting this 94-foot prestressed-concrete beam into place for a Trinity River crossing in Texas is no problem for these two cranes. But Span, Inc., Dallas, faced a problem in transporting the beams by truck 30 miles to the site. Its answer: a rear carriage operating on the steering principle used by fire trucks.

Rock used as fill in the runway extension project at the airport near Huntington, W. Va., is loaded out to a Euclid 22-ton rear-dump by a Bucyrus-Erie 51-B shovel. The extension job is being handled by Burkholder & Burkholder, Washington, D. C.

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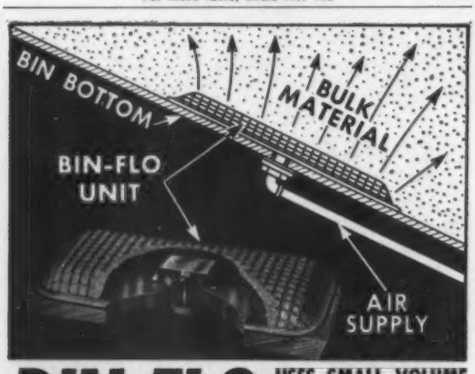

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General Tire builds tire-test track in Texas

Construction is well under way for one of the world's largest tire-testing tracks near Uvalde, Texas. Designed by the engineering division of The General Tire & Rubber Co., Akron, Ohio, the 2-lane 8½-mile testing oval will be completed by September.

The site offers near-perfect conditions for testing—temperature conditions, more than 5,000 acres of uninhabited land, and a caliche rock base.

A high-speed testing facility, the track will have 1-mile radius turns and straightaways of approximately one mile. The over-all track will be 44 feet wide on an 8-inch compacted base. The top surface will be rock asphalt. The outer lane, principally designed for testing of automobile tires, will be banked to meet the speed requirements. The inner lane is designed for truck-tire testing. The lanes will be enclosed by deerproof fence on both sides.

Service facilities include a 3,000-square-foot office building and an 8,000-square-foot garage for the truck and automobile fleet that will be operated there.

Future plans will provide for additional testing of off-the-road and farm-equipment tires.

The cost of the test track will be over $400,000.

Power-plant model helps to solve design problems

A scale model of the Yankee Atomic Electric nuclear power plant at Rowe, Mass., is helping engineers and scientists to visualize problems in the design of the plant.

The model is being used to help solve problems of piping flexibility, drainage, shielding, manpower access, missile protection, and accessibility of valves and equipment for maintenance in place or removal. In addition, the model is invaluable for coordinating mechanical-engineering and structural design.

The scale model is being used by engineers of the Stone & Webster Engineering Corp., Boston and New York City, which holds the contract for the construction of the plant.

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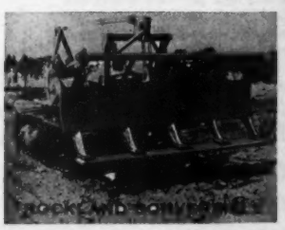

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Working in the upper reaches of the Mississippi River, north of Minneapolis, a Lorain 50, with ¾-yard dragline bucket, digs a 20-foot-deep 500-foot-long pipeline trench for a 24-inch gas line. The line is being laid deep so that future channel dredging for navigation will not disturb it.

Loading in a fill area of Interstate 41 in northern Tift County, Ga., are two Caterpillar DW21's. W. L. Robinson Construction Co., College Park, Ga., the contractor on this 7.2-mile section, used Gulf Dieselect fuel, specially designed for high-speed diesel engines, in all earthmoving equipment on the job.

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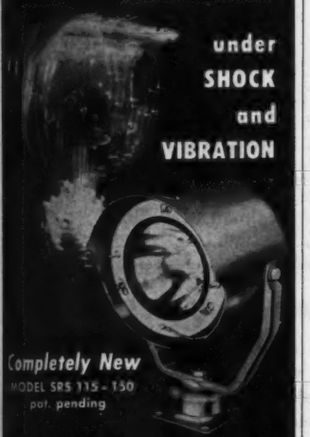

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NCA gives safety awards

The National Constructors Association has presented 1958 safety awards to six companies. Those who received awards are: Blaw-Knox Co., Pittsburgh; Chemical Construction Corp., New York City; The H. K. Ferguson Co., Cleveland; Kaiser Engineers, division of Henry J. Kaiser Co., Oakland, Calif.; Koppers Co., Inc., Pittsburgh; and Arthur G. McKee & Co., Cleveland. All companies are members of the NCA. The accident frequency and severity rates of these firms were lower than the association average.

NCA also reported that the safety record of its members was approximately 25 per cent better than that of the heavy-construction industry as a whole. The association disclosed that its 23 members had an average accident frequency rate of 15.61—or 15.61 accidents per million man-hours worked. This compares with a frequency rate of 19.72, reported by the National Safety Council for heavy construction.

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COMMENT *from the* **BUTLER ENGINEER**

. . . of pouring concrete in -32° weather and the hot (212°) Cat Girl

Supercrete Ltd., Winnipeg and other locations, is the answer to the popular song "Make Me a Miracle"—only they make multiple miracles . . . Owners of a Butler HP-85 with 2 turbine-type mixers, working alternately, the Supercrete folks pour Central Mixed at 180 yards an hour, hour in and hour out.

Not only that. Those lads can show us fantastic things about working in Siberian-type weather. Examples: trucking concrete 53 miles, temperature at –15°; pouring for 72 hours in –32° weather. Impossible! But they do it.

Well, the Ready Mixed Convention at New Orleans is behind us—but pleasant memories stay abreast. "Abreast," now there's an appropriate word, for it brings to mind the Cat Girl at one of the better N.O. hot-spots. Never in all the Butler Engineer's sophisticated experience has there been anything like it. The bumps and grinds made exotically beautiful. Like a ballet. Salome was a piker. Such disciplined muscles . . . Such a disciplined Butler Engineer. (My wife was along.)

Speaking of wives, there were over 600 of 'em at the Convention. And over 2000 men.

Hundreds tore themselves away from the Cat Girl to inspect the dramatic new Jahncke Ready Mixed Plant. It's located practically downtown on a big piece of land near the river. Wonderful system of materials handling.

Only 4 men operate everything. It's fully automated, of course, and your Butler Engineer is delighted to say "every smitch of it is Butler equipment."

Take good care of yourselves.

The Butler Engineer

BUTLER BIN COMPANY
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Some of the longest prestressed-concrete beams ever used in Ohio are set in place for a new bridge being constructed near Toledo by Geo. W. Lathrop & Sons, Inc., of that city. Eighteen of the 105-foot-long, 42-inch-deep, and 36-inch-wide beams are being used in the 4-lane structure, which will replace the present 2-lane bridge.

Prestressed beams 105 feet long used in bridge-widening project

Some of the longest prestressed beams ever used in Ohio are being installed on a 4-lane bridge near Toledo. The bridge, which will replace a 2-lane structure, is being built without interrupting the flow of traffic.

The bridge spans the Ottawa River at Suder Avenue in Lucas County, on the outskirts of Toledo. Because Suder Avenue is a key link between a residential area and the city, county engineers decided to keep it open to traffic during construction.

Geo. W. Lathrop & Sons, Inc., a Toledo contractor, first strengthened the bridge abutments, already wide enough to accommodate a 4-lane deck. Lanes were to be constructed on each side of the present bridge. When the lanes are completed, the original bridge will be lifted out, and the center of the bridge will be erected.

The 18 precast beams for the job measured 105 feet long and weighed 43 tons. Each is 42 inches deep, 36 inches wide, has a hollow core, and contains 64 7/16-inch prestressed wire strands. The Great Lakes Structural Concrete Products Co., Toledo, cast the beams and transported them to the job site.

Lifting hooks were cast into the beams to permit easy positioning by cranes. The hooks were later burned off. When all beams are in place, the bridge will be post-tensioned and completely surfaced with asphaltic concrete. THE END

Highly portable machine transports on its own trailer.
New Barber-Greene Model SJ-50 Road Widener shown in operation with strike-off attachment.

New Barber-Greene approach to road widening and shoulder paving

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New 2-unit design—the machine consists of tractor and trailer. Tractor includes receiving hopper, side discharge conveyor, power and controls. Attachments are mounted on trailer unit, giving long-wheel-base stability and new steering control and accuracy. Hydraulic jib hoist swings attachments to trailer.

New steering principle—hydraulically controlled steering gives unmatched accuracy. Extra long wheel base eliminates side-drag problems. New oscillating push rollers compensate for truck misalignment.

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Normal shoot and shovel job turned over to Michigan Scrapers

19 yd pans loaded in shale-sandstone by ripper-dozer. Load time: 30 seconds

Try digging your heel into the tight shale-sandstone terrain on this 11-mile Highway 54 relocation job east of Owensboro, Kentucky—and you'd say the soil was tough enough to shoot. But a cost-conscious dirtmover—Perrin Construction Co of Cynthiana, Ky—decided to tear it up with ripper-mounted dozers, then load with high-powered scrapers. A gamble? Perhaps. But Perrin held a pair of aces—two 262 hp, 19 yd Model 210 Michigan Scrapers.

14 pay yards per trip

First step in moving the rocky material was for the ripper-equipped 200 hp dozer to slice through the borrow area. Only one or two passes were needed to break the shale-sandstone sufficiently for the Michigans—which were then pusher-loaded. Load times, with 200 hp pusher, ran from 30 to 50 seconds. Loads weighed out at 14 pay yards. Cycles were fast . . . so fast, in fact, that on hauls of less than 1,000 feet, it took both the big pusher and a 141 hp tractor to both rip and keep up with the two Model 210's. The smaller pusher, too, needed less than a minute to heap the Michigans.

14 trips per hour

In a typical three-shift period, over typical 2,000 foot one-way hauls, the two Michigans moved 10,000 pay yards. Each machine chalked up about 200 pay yards per 50-minute hour—making 14 to 15 trips over the 4000 ft cycle. Haul speeds averaged 20 mph.

Much less tire wear

According to Mr. Perrin, "The Michigans had no trouble picking up the shale. They have lots of power and payload capacity. We especially like their torque converter drive for this rough material work. It reduces wheel spin and tire wear. With ordinary scrapers, you know, an impatient operator could grind up the drive tires within a month."

Demonstrations now available

We'd welcome the opportunity to show *you* how Michigan's power shift-torque converter drive, high ratio of hp to weight, and its high capacity (three sizes: 10½, 19, 29 yards) all can combine to boost *your* production and efficiency. Call us for a demonstration—*soon*—before you bid your next job.

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